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CONTENTS OF VOLUME XXXI. (1924).

GENERAL SUBJECTS.

	PAGES
1. Introduction to Results of Captain Buchanan's Second Saharan Expedition. ERNST HARTERT	1—6
2. Foreword to Ornithological Visit to N.W. Morocco (Spanish Province of Yebala). HUBERT LYNES	49—64
3. Introduction to the Birds of St. Matthias Island. ERNST HARTERT	261—262
4. Correction and an Addition to "An Ornithological Visit to N.W. Morocco." HUBERT LYNES	315—316

AVES.

1. Ornithological Results of Captain Buchanan's Second Saharan Expedition. ERNST HARTERT	1—48
2. An Ornithological Visit to N.W. Morocco (Spanish Province of Yebala). (Plates I (map, in duplicate), II, III, IV, V.) HUBERT LYNES	49—103
3. Notes on some Birds from Buru. ERNST HARTERT	104—111
4. Types of Birds in the Tring Museum. (Continuation.) ERNST HARTERT	112—134
5. The Birds of New Hanover. ERNST HARTERT	194—213
6. Über <i>Hieraetus ayresii</i> und <i>Spizaetus africanus</i> . E. STRESEMANN	214—216
7. The Birds of St. Matthias Island. ERNST HARTERT	261—275
8. The Birds of Squally or Storm Island. ERNST HARTERT	276—278
9. Some Notes on the Fregatidae. PERCY R. LOWE	299—313

LEPIDOPTERA.

1. On the Saturnoidean families Oxytenidae and Cercophanidae. (Plates VI—XXI.) KARL JORDAN	135—193
2. On the West African Lymantrid Genus <i>Nyctemera</i> (= <i>Otroeda</i> (Lep. Het.)). KARL JORDAN	217—226
3. On <i>Hypocysta</i> and some allied genera of Satyrinae (Lep. Rhop.) from New Guinea and the Solomon Islands. KARL JORDAN	279—297
4. Two new subspecies of <i>Sphingidae</i> . KARL JORDAN	298

COLEOPTERA.

	PAGES
1. Anthribidae from the Island of Rodriguez. KARL JORDAN . . .	227—230
2. New Anthribidae. KARL JORDAN	231—255
3. On some genera of Anthribidae allied to Exillis Pasc. (1860). KARL JORDAN	256—260

INDEX	317—328
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LIST OF PLATES IN VOLUME XXXI.

- I. Map of North and Central Marocco. (H. LYNES.)
- II.—V. Photographs of North and Central Marocco.
- VI.—XXI. The Saturnoidean families Oxytenidae and Cercophanidae.
- XXII.—XXIII. Wings and heads of Fregatidae. (GRÖNVOLD.)

NOVITATES ZOOLOGICAE.

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No. 1.

ORNITHOLOGICAL RESULTS OF CAPTAIN BUCHANAN'S SECOND SAHARA EXPEDITION

(See NOVITATES ZOOLOGICAE, XXVIII, 1921, pp. 78-141.)

By ERNST HARTERT, Ph.D.

IN March 1922 Captain Angus Buchanan left Europe again for the Sahara. The main object of his second Sahara expedition was to traverse the Sahara northwards to Algeria and to take cinematographic films and photographs, and also to complete his splendid collections of birds and mammals in these regions. As far as the birds are concerned he succeeded splendidly, adding many species to the list of birds known from the Sahara between Hausaland (Kano) and Aïr (or Asben), and he also made a trip to the west of Aïr, and eastwards to the oasis of Bilma, well known by name as the great salt-pans, from where caravans bringing salt have gone to Hausaland for centuries past and still go to-day, but very seldom visited by Europeans. In Aïr the traveller was unduly delayed, because, on account of some absolutely unfounded suspicions, probably originating from a false report of the French consul in Tripoli, he was for some time refused permission to proceed northwards of Aïr to Algerian Territory. He therefore made up his mind to travel westwards to Timbuktu and to the Senegal. As soon, however, as permission was granted he returned to Aïr and started on his long journey northwards. It would have been very interesting to us if he had collected at greater leisure in the Hoggar Mountains (or Ahaggar, as the country is always called by the Tuareg) than Dr. Geyr von Schweppenburg was able to do, who is the only man who collected zoological specimens in that region, but unfortunately soon after his arrival at Tamanrasset he suffered a severe injury to his left knee, being kicked by a stampeding camel, so that he could only bring together a rather small collection from there, which, nevertheless, is valuable to us, and supplements that of Geyr very nicely, though hardly adding to the number of breeding species.

Agades was reached July 29th, 1922. The country between Kano and Agades and the mountains of Aïr (or Asben, as the Hausa generally call it) have been briefly described in Nov. Zool., 1921, pp. 81, 82, and by Buchanan in his book *Exploration of Aïr, out of the World north of Nigeria*, London, 1921. When at Agades lions were reported at Tanut, a small place south and a little west of Agades, six days distant. A trip was made to Tanut, but lions could not be found. August 25th Aouderas was reached again, and in this region Buchanan

worked until October 4th. October 25th, 1922, he left for Bilma. The way to the oasis of Fachi, about half-way to Bilma, and to the latter place leads through absolute desert, partly flat, partly with sand-dunes, and no birds of any kind were observed. Both these oases are small and drear and sandy. No trees exist except some date-palms, though there is much very brackish surface water in ditches. Some small irrigated garden patches afford food and shelter for migratory birds, but the only resident bird there is perhaps the Desert Raven, and that is not common.

Air was left for the westward expedition on January 20th, 1923. Of this trip Buchanan sent us the following extracts from his diary:

" 26.i.1923. Camped a day at Inzanenet, having collected two Owls and a Hawk on the cliffs. This place is of peculiar interest, as there are hundreds of ancient drawings on the rocks.

" 27.i.1923. Left Inzanenet and travelled in a westerly direction to Ogba, where water is found in shallow wells, thence south-west, till we cut into the Titintarat river-bed, where we camped for a day at an altitude of 1,200 feet.

" 28.i.1923. As there is no water at Titintarat and as there are three to four waterless days ahead, and our camels had their last water seven days ago, I sent half the camels back to Ogba to be watered and bring back thirty skins of water for the rest. Left late in the afternoon and camped on hammada (gravelly ground, here called "Black Desert") an hour after dark. New guide picked up at Titintarat of the Kel-Tedili, a Tuareg tribe.

" 29.i.1923. Travelled seven hours and camped at small grass valley at head of Oued-Igadayen, altitude 1,100 feet. Tracks of robbers who attacked Tigguida-n'Tisemt were crossed just before we camped. In the morning a native on camel was seen, passing south of us. Atagoom and I headed for him, as we wanted information about water, but the fellow made off in haste. We followed and eventually got up to him. He was an Ehaggaran from Timmerson, and on his way to Anu-Nageruf, S.W. of Titintarat, a terrible journey, even for a native. He was frightened until he found out that we were friends. We passed through very dreary country to-day, hammada or Black Desert (all small black gravel) throughout and level as far as one could see.

" 30.i.1923. Marched to the Takkaresh marsh (Maader de Takkaresh), camped and skinned remainder of day.

" 31.i.1923. Marched to Tamat-Teddret, where we camped for the rest of the day. Here there are wells, not very deep, but water plentiful, unfortunately brackish. Country here dead flat, but of red clay, flooded during rains, growing, a seed-grass eagerly eaten by sheep in particular, and there are donkeys, camels, and some goats. The name of the grass is A-sha-wur, and its seeds are eaten as grain by the Egummi nomads who are found in small numbers in this region. This dried grass I have not seen elsewhere. Coming from the east the well is situated on the far side of a bare stretch of land on the edge of a thin line of scrub bush. The red clay begins soon after Takkaresh and continues south to Tigguida-n'Tisemt. This is the great water-basin of Air. During the tropical tornados this whole region is under water. The cold season is followed by a season of hot days with intense cold before sunrise. To-day the first harmattan mists seen.

" The high mountains of Air (Asben) attract the rain over vast areas, and were it not for the rains that fell on these mountains and are drained into rivers

in valleys with tropical vegetation, this part of the Sahara would be absolutely barren desert.

" 1.ii.1923. Travelled southwards as far as the river-bed of Irazzer-Agadès, halting *en route* at Tchbunker, where there were camps of Ehaggaran (inhabitants of Ahaggar) and Egammi. Country still flat, red clay, sometimes without vegetation, sometimes cracked and interspersed with big stretches of grass.

" 2.ii.1923. Reached Tigguidda-n'Tisemt, a place inhabited by the Ezouarin tribe, who speak their own Ezouarin language, not Tamashek (Tuareg). There is no water between Tigguidda-n'Tisemt, but striking in a north-westerly direction from the latter place we found near Toduf the best growth of bush seen since leaving the Aïr Mountains. Except some 'Giga' the trees are all 'Tamat' acacias. These 'Tamat' drop yellow flowers after the rains, which are eagerly eaten by goats, sheep, and Dorcas gazelles. They have madder-red curved pods about one and a half inches in length, which are good camel food. 'Tamat' grows in Damergu and Aïr, but not in Hausaland, where, however, a similar but different species is found.

" As the country here has had very little rain this year, the trees look very wintry even at this season.

" 7.ii.1923. We reached In-Abbanganrit, where we stopped to take water. On the way we collected firewood, as none would be found ahead. A great many old Oryx tracks were observed in the early part of the day; they come north in October, viz. just after the rains, and large numbers are then killed by the Ehaggaran (Tuareg of Ahaggar grazing their camels and goats here at that time of the year).

" There is at In-Abbanganrit a lone well of fine water only 30 feet below the surface, which is impossible to find if one is not guided there. I found two Ehaggaran and a naked boy filling many skins with water to carry back to their camp at Tessellaman, about 25 and 30 km. north. They make the journey every five or six days, taking with them enough water 'for making tea' and cooking, and they live chiefly on camel milk. A man named Budari consented to guide us to the sand-dunes further west, and we moved off again about 5 p.m.

" The Ehaggaran living out in these great unprotected wastes strike one as being a much finer type of men than the Targi of the mountains of Aïr."

As soon as news was brought to Buchanan that he would be allowed to travel northwards to Algeria he returned, and on February 25th he reached Ifrouan in north Aïr. Two days later he left for the Ahaggar Mts. Of the long journey from Aïr to Ahaggar the following diary notes are of special interest. All this country is uninhabited sandy or stony desert without any water-fed land, though a few wells are found at great distances from each other.

" 8.iii.1923. Reached Inouar, 1,500 feet high. Where we camped was some 'Had' (*Cornulaca monacantha*, according to information by Dr. Schweinfurth), a plant of which the camels are very fond. Some fairly high hills at the camp.

" 9.iii.1923. Travelled six and a half hours through barren rocky country in rapid decay. In the little valley in which we camped the trees were dead and only small scanty tufts of grass existed for camel food. No birds of any kind were seen. The rocks in this country seemed to be in the process of crumbling away into desert sand, nothing but broken rock and sand. About two hours before we passed half a dozen tracks of Addax.

" 10.iii.1923. The hills petering out into coarse quartz sand followed by open sandy stretches upon which seem to sit groups of pill-box or church-like, curiously shaped hills. Everything very barren, true desert, but not continuous sandy plain. No birds at all, even more deserted than the country at Bilma. A few trees in shallow hollows, but nearly all dead. A few thorn-trees, however, called 'tishra' were alive. The camels have no food to-day except what we carried with us. It is true that there were a few tufts of hard grass where we camped, but the hungry camels merely sniffed at them and turned away without eating them. A few Addax tracks were again seen to-day, and at yesterday's camp a few house-flies, grasshoppers, and one yellow spiny lizard.

" 11.iii.1923. Reached In-Azaoua. Here we pass the provisionally accepted administrative boundary between 'L'Afrique Occidentale Française' and the 'Territoire du Sud de l'Algérie.' Here the Foureau-Lamy Expedition camped on their memorable journey, and the ground is thickly strewn with the bones of the camels that died here on that (for the camels horribly disastrous) expedition. There are two well-openings in the flat valley filled up with driven sand, and a dozen men have worked since noon to excavate down to water. On the north bank of the valley is the old encampment of the Foureau-Lamy Expedition.

" 12.iii.1923. The Sahara is here not entirely devoid of vegetation, but the encroaching sand kills the plants, even more than the lack of rain. If rain in sufficient quantity would fall for two or three years the country would doubtless regain its vegetation with astonishing speed.

" The interesting plant called 'Had' is found here, but dry and dead. The people say that 'Had' does not die unless there are more than four years without rain. If this is correct there cannot have been any rain for more than four years."

On March 25th the caravan reached Tamanrasset, on the southern slopes of the Ahaggar (Hoggar) massive.

Here Captain Buchanan had the accident mentioned before, so that for some time he was unable to do any collecting.

" 8.iv.1923. Camped in the Oued Nes-Zimit, a rocky river-bed among the mountains, sixteen and a half miles east of Tamanrasset, altitude 4,500 feet. Ice on my wash-basin in the morning, strong ice! Hardly any birds seen, none worth collecting except a Barn-Owl, which, however, was not obtained. The only common birds along the road in this region are Saharan Larks (*Ammomanes*) and the Black Wheatear (*Oenanthe leucopyga*). A few Trumpeter Bullfinches (*Erythrospiza*) and one lot of Saharan Bush-Babblers (*Crateropus fulvus buchanani*) were the only other birds observed to-day.

" 9.iv.1923. Reached the abandoned Fort Motylinski, vacated nine years ago. The height in the oued below the fort is 3,800 feet. The natives call this place Tarahowhowt. One and a half hours after starting from Tamanrasset the river-bed called Tarahowhowt was reached and we travelled along the same as far as the fort, which is built on a high hill with whitened summit. The country round about is very uninteresting; there are some salt-bushes near Motylinski, otherwise the country is bare, and in the river-beds are the same dried-up plants as at Tamanrasset. The country is badly in want of rain. The four common plants of the river-beds in Ahaggar are:

" *Atriplex (halimus?)*. (*Chenopodiaceae*.) (In Ahaggar Tamashek 'A-ram-as.'). A pale bushy 'woody' plant in all river-beds and on stony banks.

" *Deverra scoparia*. (*Umbelliferae*.) (In Ahaggar Tamashek 'Ta-tight.')

Common. [Widely distributed in the Saharan regions from Tripolitania to Algeria. Cf. Nov. Zool., XX. p. 157.—E. H.]

"*Zilla myagroides* Forsk. (*Cruciferae*.) (In Ahaggar Tamashek 'Af-tusin.') A thorny bush, growing in bunches in all the river-beds in Ahaggar. The flower is pale purple.

"*Thesium* spec. ? (*Santalaceae*.) (In Ahaggar Tamashek 'Tigh-gock.') Seen much in company with the *Zilla*. A somewhat feathery grass-like plant with a very strong pungent perfume. Not seen in Aïr. The camels eat it in small quantity only.

" 10.iv.1923. Travelled seven hours and camped in the Een-dali river-bed, in a place where the natives cultivate some wheat! There is much water in this river very close to the surface under the sand. Altitude at camp 3,800 feet. Most of the day passed through bare rocky scenery very similar to that of Aouderas in Aïr. All the acacias seen to-day were leafless on account of the prolonged drought, no rain having fallen, and most of them were cut to pieces to feed the goats with in extremity. Now the goats have been driven away to graze elsewhere. The natives seen so far in the Ahaggar do not have the timidity of the Aïr Targi. They are all armed and do not have the dread of robbers that is usual among the people of Aïr.

" 14.iv.1923. Started on the way to Tazeruk. After four hours marching camped in the Wadi (Oued) Tchnorafen, at an altitude of 4,500 feet. High wind all day, clouds in the morning. The rocky hills here look exactly like many of those of Aïr, especially the bare disintegrating hills of brownish colour without pronounced features (such as cliffs or great boulders).

" 16.iv.1923. Again open water passed to-day. There seems indeed to be much more open water than in Aïr, but bird-life is scarcer and very disappointing; hardly any birds seen to-day.

" 23.iv.1923. Reached the Idelès river-bed. I asked if they remembered Geyr von Schweppenburg's visit to Idelès in 1914, and one man said he remembered that the white man gave needles to a woman and paid eight shillings for a goat.

" The whole country between Ahaggar and In-salah is rocky and barren, with very little life of any kind, and uninhabited by men, though a few nomads may at times be met with. South of In-Salah begins absolutely bare sandy desert. The hills of Emmidi (Mouydir) are, however, fairly large and more fertile than the rest of this region, and it would be possible to feed and water camels if one camped there to collect."¹

After leaving Idelès Captain Buchanan travelled home as fast as possible and did not attempt to collect. On May 13th he arrived at In-Salah, May 31st at Ouargla, and June 5th Tuggurt, from where he took train to Alger, reaching England again before the middle of June 1923.

It is a pleasure to work with the fine skins made by Captain Buchanan, which are all they should be. This collection adds the following species and subspecies to the ornis of Aïr proper (cf. Nov. Zool., 1921, p. 83):

Pterocles senegallus, *Pterocles senegalensis senegalensis*, *Pterocles coronatus*

¹ [When I was in In-Salah in 1912 the mountains of Mouydir were reported to be very dry, and there was said to be no water for my camels. It was then said that no real rain (only a few drops now and then) had fallen for about fourteen years. Recently the commandant of In-Salah kindly informed me that rain had only fallen once at In-Salah since 1912 for a short time, but that it had rained more or less heavily in Mouydir and the mountains in the neighbourhood.—E. H.]

coronatus, *Philomachus pugnax* (M¹), *Ardea purpurea purpurea* (M), *Aquila rapax belisarius*, *Circus macrourus* (M), *Falco tinnunculus tinnunculus* (M), *Tyto alba affinis*, *Bubo africanus cinerascens*, *Bubo bubo desertorum*, *Otus leucotis leucotis*, *Athene noctua solitudinis* subsp. nov., *Mesopicos goertae koenigi* (instead of *M. g. goertae*), *Lybius vieilloti frater* (not *L. v. vieilloti* !), *Caprimulgus europaeus europaeus* (M), *Caprimulgus eximius simplicior*, *Macrodipteryx longipennis*, *Apus apus apus* (M), *Hirundo rustica rustica* (M), *Oenanthe deserti deserti* !, *Monticola saxatilis* (M), *Hippolais pallida opaca* (M), *Sylvietta micrura brachyura*, *Anthus trivialis trivialis* (M), *Mirafra erythropygia*, *Mirafra cheniana chadensis*, *Sporopipes frontalis pallidior*, *Spreo pulcher pulcher*.

More than ever it is clear that the ornithology of Aïr (Asben) is tropical, as a country where Sunbirds, Barbets, Glossy Starlings, etc., live has a tropical ornithology, though there are a number of palaearctic species, to which now a few must be added, such as *Pterocles senegallus*, *Bubo bubo desertorum*, *Oenanthe deserti* !

On the other hand, these striking tropical families like Sunbirds, Glossy Starlings, Emerald Cuckoos, Hornbills, Barbets, are absent from the Ahaggar (Hoggar) Mountains, and the almost lifeless desert between Aïr and Ahaggar forms the boundary between the palaearctic and tropical African faunas. Buchanan also gives for the first time information about the birds of the great salt-oasis of Bilma, but it is very meagre and of very little interest. Very little collecting could be done in the Ahaggar Mountains, but Buchanan confirms the very great scarcity of animal life and also the differences of the few specialised forms discovered there by Dr. Geyr von Schweppenburg.

1. *Numida galeata galeata* Pall.

Hausa name "Zabo," not "Labo" ! Tuareg name "Tilel."

In Baguezan Mts. Buchanan never heard these birds call; they retired to the rocks during the day and came down to feed when almost dark.

A small chick taken Tararet River, Aïr, 10.ix.1922.

2. *Coturnix coturnix coturnix* (L.)

Tetrao coturnix Linnaeus, *Syst. Nat.*, ed. x. i. p. 161 (1758—"Europa, Asia, Africa"; restricted typ. loc. Sweden).

A ♀ of the Common Quail shot at Technorafen River bed, Ahaggar Mts., 14.iv.1923.

Probably only a bird of passage in the Hoggar Mts., though a few might occasionally remain to breed. Geyr observed only single specimens 29.i Temassinin, end March Idelès, 24.iv Amgid, and caught a damaged ♂ 5.v on the well of Ta-n-elak.

3. *Ptilopachus petrosus brehmi* Neum.

Ptilopachus fuscus brehmi Neumann, *Bull. B.O. Club*, xxi. p. 68 (1908—"Jebel Melpes," now spelt Melbis, Kordofan, type in Tring Museum).

♀ ad., ♂ juv., Dan Kaba, North Hausaland, 12.v.1922. "♀ Iris dark brown, bare skin round eye full coral red. Bill pale dull brownish, cere and corner of mouth pale coral pink. Feet coral red."

The young bird (less than half grown) has the upperside brown with pale

¹ The species marked (M) are undoubted migrants.

and blackish cross-markings and fine mottlings; wings more cinnamon than in adults; rectrices black with rufous spotted cross-bars; underside brownish buff with deep brown cross-bars, throat lighter, lower abdomen darker, under tail-coverts blackish. "Iris dark, feet pale blackish coral red, bill soiled brownish."

Mr. Buchanan found these birds in a valley with rich vegetation, among a carpet of dead leaves under the shade of a big tree.

The specimen agrees with the specimens of *brehmi* in London and Tring, and is certainly different from Senegal *petrosus*.

4. *Francolinus clappertoni clappertoni* Childr.

Nov. Zool., 1921, p. 85.

A female Farak, Damergu, 16.vi.1922. "Iris dark brown. Bare skin round eyes, skin over nostril and corners of mouth coral red. Feet deep blackish red, clearing to red on underside. Bill black." Small black seeds and larger greenish grain was found in stomach. The Hausas whom Buchanan questioned had the same name for this as for *Francolinus bicalcaratus*, namely "makarua" or "fakara"; in 1886 I understood the name of *F. bicalcaratus* "mokorua," which may be as correct as Buchanan's spelling.

5. *Francolinus bicalcaratus bicalcaratus* (L.).

Tetrao bicalcaratus Linnaeus, *Syst. Nat.*, ed. xi. i. p. 277 (1766—Senegal, ex Brisson).

♂ Rimi, 2.v.1922, ♀ Dan Kaba, Northern Nigeria, N.N.E. of Kano, 10.v.1922. The ♀ is darker, the ♂ lighter on the upperside, also underneath, the ♀ with larger black, drop-shaped spots in the middle of the feathers on the underside; these variations are, however, usual in game-birds. An addled egg was found at Dan Kaba, 16.v.1922. It has a thick shell, cream-coloured, measuring 44.6×34.5 mm. (Native name see under *F. clappertoni*.) Many were seen in North Hausaland from Kusada to Katsena.

6. *Fulica atra atra* L.

Fulica atra Linnaeus, *Syst. Nat.*, ed. x. i. p. 152 (1758—Europe; restricted typical locality, Sweden).

A ♀ Coot was taken at Bilma oasis, 9.xi.1922. It seems not to have been known to occur south of Algeria and Morocco in N.W. Africa.

7. *Pterocles senegallus* (L.).

Tetrao senegallus Linnaeus, *Mantissa Plantarum, Regni An. Append.*, p. 526 (1771—"Senegallia," ex Daubenton, pl. 130; locality evidently erroneous; I accept Algeria as its terra typica).

2 ♂, 1 ♀ shot Tabbello, in Aïr, 22.x.1922 and 16.ii.1923. The specimens are in fresh plumage, the males from Tabbello, shot in October, still moulting, and very richly coloured. I do not, however, believe that they form a different subspecies, as skins from Shendi in Nubia, and others, are quite as dark, though not separable from our Algerian series. The Tuareg name was given at Timia as "tagaduk," which seems to apply to various species of sandgrouse.

8. *Pterocles senegalensis senegalensis* Licht.

Pterocles senegalensis Lichtenstein, *Verz. Doubl. Mus. Berlin*, p. 64 (1823—Senegambien, Aegypten, Nubien).

♀ ad. and ♀ juv., Tebeig, southern Aïr, 28.vii, ♀ juv. south of Agades, 6.viii, ♂ ad. Marandet, South Aïr, 8.viii.1922. The young ♀ resembles the adult, but the markings on the upperside are narrower and more in zigzags. Great numbers were seen in the district where the above were collected, after the rains had set in.

9. *Pterocles lichtensteinii targius* Geyr.

Nov. Zool., 1921, p. 86.

A ♂ and 3 ♀ shot at Tchwana, S.E. of Agades, 10.vii.1922. Bare skin in ♂ pale lemon yellow, in the females pale greenish yellow. Wing ♂ 199, ♀ 186, 186.5 mm. Numbers were flying to the only water pool in a rocky river-bed at Tchwana at dusk. At Timia the Tuareg name was given as "tagaduk."

10. *Pterocles coronatus coronatus* Licht.

Pterocles coronatus Lichtenstein, *Verz. Doubl. Mus. Berlin*, p. 65 (1823—Nubia).

A fine adult male was shot at Tabello, Aïr, 22.x.1922. "Iris dark amber. Bill medium grey with slight black tip. Feet white, claws as bill."

This specimen, like the ones of *P. senegallus*, extends the known distribution of this beautiful species considerably. The colour is very dark and rich, there being distinct blackish-grey edges to the cream-coloured spots on the upper wing-coverts; it is thus darker than our examples from South Tunisia and Nubia, though not at all like *P. c. atratus* from Asia. It is fortunate that Messrs. Sclater and Praed (*Ibis*, 1920, p. 839) refrained from naming the two races which they suggest, as the Asiatic one had already been named by me, while I do not find southern Tunisian examples paler, but rather a male from Kerma (Nubia) palest of all, paler than Tunisian ones. I therefore believe that all African specimens belong to one and the same subspecies.

11. *Pterocles quadricinctus quadricinctus* Temm.

Pterocles quadricinctus Temminck, *Pige. et Gall.*, iii. pp. 252, 713 (1815—Coromandel coast errore! Real locality Senegal colony).

4 ♂ ad., 1 ♂ moulting into adult plumage, outer primaries still those of first plumage, chestnut breast-band not yet quite complete. Farniso, near Kano, 14, 15.iv.1922. "Iris dark brown, skin around eye lemon yellow. Bill soiled yellowish sienna. Feet dull orange. Wings 180–187 mm. (Length of wing appears to be very variable.) While our skins from the Upper White Nile, coll. by L. M. Seth-Smith, are no bigger than the western ones, one from Lake Zuai, coll. by O. Neumann, and one Kassam River, southern Abyssinia, Zaphiro coll., have wings of 208 and 212, 4 from Nenesa, Abesata, Ödön Kovacs coll., have the wings in moult and are not safe to measure. *P. q. lowei*, however, was described from Renk on the White Nile.

Hausa names at Kano "drua" and "towrie."

12. *Ortyzelos meiffreni* (Vieill.).

Buchanan saw a specimen at Rimi, south of Katsena, Hausaland, 2.v.1922, i.e. further north than he collected it in 1920. The explicit paper on the anatomy and pterylography by Lowe, *Ibis*, 1923, seems to prove conclusively that *Ortyzelos* belongs to the Hemipodes (*Turnices*), as has been suggested before, and as I have maintained in *Vög. pal. Fauna*, p. 1855, and Nov. Zool., 1921, p. 87.

13. *Lissotis nuba* (Cretzschm.) (? subsp.).

Otis nuba Cretzschmar, Atlas z. Reise von E. Rüppell, *Vögel*, p. 1, pl. i. (1826—on the Nile above Kurgos in Southern Nubia).

“♂” Taberghi, six or seven days north of Tanut in Damerghu, 4.vii.1922. “Iris pale whitish stone-grey. Bill pale green, most of distal half dull black. Feet cream-white.”

This specimen agrees in size with the female of *Lissotis nuba* from Kordofan. Buchanan says it is a young male, but I am convinced that it is a female! It is in full moult (body plumage, wings, tail) and is probably an adult bird. While the old feathers are paler, the fresh ones are about as dark as in *L. nuba*, of which we have beautiful males and a female which died in the Giza Zoological Gardens. Beneath the rufous chest-band is a band of bluish grey, with a few barred-speckled feathers; in other *nuba* this band is entirely speckled or irregularly barred; there are no uniform blue-grey feathers. This may mean another subspecies, but we have only one adult ♀ in Tring, and in the British Museum is only a *not* fully adult ♀ (not an adult bird, as the *Cat. B.*, xxiii., says) from the 5th cataract of the Nile, and adult males from the Giza Gardens. It is therefore impossible to say if this difference is individual, or whether the birds from the Western Sudan are a different subspecies. Should it be a male, it would of course be a very much smaller form! The wing measures about 423 mm., while the wings of males measure about 440 or more and that of our ♀ 410 mm. But the tarsus is 115 as in our ♀, while the tarsi of males are much thicker and measure 130, and the bill is as in our females, not as in the males.

Two eggs were taken at Marandet in South Aïr, 17.viii.1922. One is pale stone-brown with pale rufous-brown spots and longitudinal patches and some paler deeper-lying ones with a faint mauve tinge. It is glossy, fairly pointed on one end, and measures 70.5 × 47.5 mm. The other one is more stone-grey and has deep rufous brown and distinct purplish-mauve spots. It is broken, only about two-thirds of it being present, therefore not measurable. The eggs appear to be not yet known.

Mr. Buchanan saw also a specimen near Tessawa, west of Zinder. The Tuareg gave him the name “Ageize” or “Agaze” as referring to these Bustards. They eat locusts and other insects and the natives say also the gum that oozes from the acacia-trees.

14. *Otis senegalensis senegalensis* Vieill.

♂♀ ad., Dan Kaba in northern Hausaland, 8, 13.v.1922. The iris of the ♂ is described as pale glassy brown, that of the ♀ as clear cream white, feet very pale yellowish cream. These Bustards were also seen quite numerous north of Kusada.

15. *Tringa ochropus* L.

♀ ad., Ten-a-Curt, near Tamanrasset, Hoggar Mts., 23.iii.1923.

16. *Philomachus pugnax* (L.).

♂ Aouderas, Aïr, 15.ix.1922.

♀, Tazeruk, Hoggar Mts., 20.iv.1923.

17. *Capella gallinago gallinago* (L.).

Scolopax Gallinago Linnaeus, *Syst. Nat.*, ed. x. i. p. 147 (1758—Europa; restricted typical loc., Sweden).

The only specimen of our Common Snipe seen and shot was a ♀ near Bilma oasis, 8.ix.1922, in beautiful fresh plumage.

18. *Sarciophorus tectus tectus* (Bodd.).

Observed near Farniso (near Kano), 17.iv.1922, where half-grown young were caught by natives. Hausa name "Zakara Foko" and "Zakara N'kakwa."

19. *Burhinus (Oedienemus) capensis maculosus* (Temm.).

♀ ad., Guam Berka, Zinder Territory, 19.v.1922 (iris greenish yellow).

♂ ad., N.W. of Farak, Damergu, 26.vi.1922 (iris clear yellow). Hausa name (at Katsena) "Kelikeli."

These specimens agree perfectly with the ♂ from Aouderas collected in 1920. Also observed near Dan Kaba.

About the subspecies and nomenclature I can only repeat what I have said in 1921, pp. 88, 89. The ♂ has larger white patches on the outer primaries than the ♀. Wing ♂ 228, ♀ 228 mm.

Two eggs found on bare sand, near a small piece of dead wood, no nest, not even a sand-scraped hollow. One egg was broken; the other, very hard set, is a typical Stone Curlew's egg, the ground-colour rather reddish, with many large and smaller deep rufous-brown patches and spots, and it measures 49 by 35.5 mm.

20. *Cursorius cursor cursor* (Lath.).

(*Cursorius gallicus gallicus* auct.)

Charadrius cursor Latham, suppl. 1, *Gen. Synops. B.*, p. 293 (1787—name of the "Cream-coloured Cursor" from Kent!).

♂ ad., S.W. of Agades, Aïr, 7.viii.1922. Wings, tail, and a few body-feathers moulting.

♂ ad., In-Abbangarit, W. of Aïr, 7.ii.1923. Five seen. "Iris very dark amber, feet clear chalk-white." Tuareg name: Tukorokora.

Evidently very rare in the southern Sahara, but as Boyd Alexander shot it near Lake Chad, its occurrence in and near Aïr was to be expected.

21. *Turtur abyssinicus delicatulus* (Sharpe).

[*Chalcopelia abyssinica* Sharpe, *Bull. B.O. Club*, xii. p. 83 (1902—Kokai in Bogos Land).]

Chalcopelia delicatula Sharpe, t.c., p. 84 (1902—Goz-Abu-Gumar on the White Nile).

♂, Dan Kaba, 12.v.1922.

This specimen, together with one from Gambaga, is apparently a shade lighter than our three Senegal ones, but they cannot at present be separated from

the latter. If the black-billed form from the White Nile differs from the Bogos one, these birds, together with other West African ones, will probably belong to the former, i.e. Sharpe's *delicatula*. Possibly all the blue-spotted birds with black bills are one and the same, though specifically different from the green-spotted forms as well as from the blue-spotted ones with red bills; these red-billed birds seem to occur together with black-billed ones in various countries. (Cf. *Ibis*, 1920, pp. 834-836.)

Buchanan only came across the Blue-spotted Dove once, at Dan Kaba, in northern Hausaland, 12.v.1922, where he saw flocks and shot a single male, moulting on wings and body. "Iris dark. Bill dull black! Feet dark purple. In the stomach small grass seeds." They were fairly plentiful in a valley with rich vegetation and large trees. He noticed their peculiar short, swiftly diving flight. The Hausa called it "Burdu."

22. *Streptopelia senegalensis senegalensis* (L.).

A nest with two eggs was found on a Baga-Rua thorn-tree at Turabé, near Aouderas, in Aïr, 4.ix.1922. The nest was a small structure of fine twigs. The eggs measure 24.5×20 and 25×19.8 mm. This reminds me that there is a silly slip on p. 90 Nov. Zool., 1921, the width of the clutch taken December 19th being 19.8 and 20, not 14.8 and 15 mm.!

23. *Streptopelia roseogrisea roseogrisea* (Sund.).

♂, Gangera in Damergu, 4.vi.1922.

4 ♂ Tch-Siderak, Aïr, 12, 13.i.1923.

♀ Tchwana, Aïr, 11.vii.1922.

♂ Eluzzus River, Aïr, 6.x.1922.

♂ Iberkan River, Aïr, 8.x.1922.

This Dove, called "the Dove of the Sand-wastes" by Buchanan, can always be remembered from *S. vinacea* by the bright clear red or crimson iris. Near Gangera in Damergu it was seen in considerable flocks, coming to the wells to drink. The Tuareg call it "Tedabear," a name applied to most species of Doves.

Not only the colour of the under-wing coverts (see Nov. Zool. 1921, p. 90) varies, also that of the abdomen. Possibly the specimens from the south-western Sahara may average slightly larger in the wing than those from the eastern Sudan and Nubia, but they vary very much; wings of eleven males 162-171, of two females 162, 165 mm.

24. *Streptopelia turtur hoggara* (Geyr.).

♂♀ ad., Tamanrasset, Hoggar Mts., 27, 30.iii.1923.

♂ ad., Een-dal-i Wadi, Hoggar Mts., 11.iv.1923.

3 ♂, 2 ♀, Tazeruk, Hoggar Mts., 17, 19.iv.1923.

The iris is described as clear golden yellow, while in *S. t. arenicola* I found it always dull orange, though Carruthers marked it in a ♂ from Bokhara as gamboge yellow. Buchanan found the bare skin around the eyes dark purple, feet reddish purple.

Wings ♂ 172-174, ♀ 164-167, in Aïr specimens; ♂ 176, 169, ♀ 173 mm.

These birds are perfectly intermediate between *S. t. arenicola* and *S. t. isabellina*; from the latter they differ only in having the crown more or less blue-

grey, but two females are almost exactly as isabelline on the crown as Egyptian *isabellina*; some are darker on the back and wings than *isabellina*, but still distinguishable from *arenicola* by the isabelline sides of the head! *S. t. arenicola* is perfectly intermediate between *S. t. turtur* (sometimes single individuals difficult to distinguish!) and *S. t. hoggara*!

At Tazeruk quite a number were observed. Tuareg name: Tedabear Ta-meekat, meaning "Dove of Mecca."

25. *Columba livia targia* Geyr, 1916.

1 ♂, 2 ♀, Tamengouit, northern Aïr, 3.iii.1923.

♂, Toderà Mt., Aïr, 22.ix.1922.

♂♀, Tamanrasset, Hoggar Mts., 26.iii.1923.

"Iris inner circle clear pale gamboge white, outer border darker rusty sienna. Bill dull grey-blackish or black, nostrils chalk white. Feet red with purplish tinge or purplish red. Iris of a young bird entirely dark golden brownish." Crops and stomachs full of seeds of *Citrullus colocynthis* Rich. and those of an Euphorbiacean plant (Schweinfurth determ.). It is strange that they can eat these strongly purging seeds.

This is merely an always grey-rumped, somewhat dark-grey form of Rock-Pigeon; the extent of the glossy area on the throat, etc., is not more restricted than in other forms. Its grey plumage is darker than in *schimperi*, which is also smaller. *C. l. targia* hardly differs from grey-rumped *C. l. gaddi* from South Arabia, but the back and wing-coverts are duller, slightly darker, and there seems to be a darker area just below the glossy jugular patch in the Arabian birds, which is not visible in any *C. l. targia*. Wings ♂ 213–216, ♀ 202–210 mm.

At Tamengouit observed in large flocks, nine shot altogether. In the stomachs the seeds of a gourd called "Tagelit," which is also eaten by goats, donkeys, and cattle, but not by camels (see above).

26. *Nyroca nyroca nyroca* (Güld.).

Anas nyroca Gùldenstadt, *Nov. Comm. Sc. Petropol.*, xiv. i. p. 403 (1770—South Russia).

The remains of a female (skeleton, wings and feet) were picked up in the rocky desert of Ta-Mosilin, two days north of In-Azdoua, on March 15th, 1923.

27. *Spatula clypeata* (L.).

Anas clypeata Linnaeus, *Syst. Nat.*, ed. x. i. p. 124 (1758—Europe; restricted typical locality, S. Sweden).

A ♂ Shoveler was shot at the oasis of Bilma on November 6th, 1922, when a number of the same species were seen.

28. *Anas acuta acuta* L.

Anas acuta Linnaeus, *Syst. Nat.*, ed. x. i. p. 126 (1758—"Habitat in Europae maritimis"; restricted typical locality, Sweden).

♀, oasis of Bilma, 5.xi.1922.

29. *Anas crecca crecca* L.

Anas crecca Linnaeus, *Syst. Nat.*, ed. x. i. p. 125 (1758—"Habitat in Europae aquis dulcibus"; restricted typical locality, Sweden).

♀, Bilma oasis, 8.xi.1922.

30. *Nycticorax nycticorax nycticorax* (L.).

Ardea Nycticorax Linnaeus, *Syst. Nat.*, ed. x. i. p. 142 (1758—"Hab. in Europa Australi").

Single specimens of Night Herons were seen and shot.

♀ ad., Bilma oasis, 8.xi.1922. "Iris clear crimson. Feet cream-white."

♀ juv., Bilma oasis, 6.xi.1922. "Iris clear orange yellow. Feet pale whitish glass green."

31. *Ardea purpurea purpurea* L.

Ardea purpurea Linnaeus, *Syst. Nat.*, ed. xii. i. p. 236 (1766—"Habitat in Oriente"! This statement is evidently erroneous; the description is from Brisson, who described specimens from the collection of Madame de Bandeville and said that they were found on the borders of rivers and swamps and live on fishes; the typical locality would therefore be France and not the Orient!).

2 ♀♀ shot Aouderas 14.ix and 31.xi.1922, also one handled at Fashi.

32. *Abdimia abdimii* (Licht.).

At Dan Kaba in northern Hausaland a nest of sticks was found, 15.v.1922, on a leafless Baobab tree, containing two fresh eggs. These are glossless white, sea-green if held against the light, and measure 55.5×41 and 58×41.5 mm. Hausa name, "Shamwona."

33. *Plegadis falcinellus falcinellus* (L.).

♀ shot Aouderas, Aïr, 13.ix.1922.

Tuareg name, "Agishet amá."

34. *Necrosyrtes monachus monachus* (Temm.).

Of this, the common Vulture of northern Nigeria, a ♀ was shot at Farniso, near Kano, 9.iv.1922. "Iris dark brown. Head skin pink (!). Bill soiled light greenish. Feet whitish, tinged with pale green-grey."

(At Aouderas and elsewhere the eyes of *Gyps rüppellii* are sought after and Buchanan was asked to shoot one. After death the eye is pricked with a thorn, and the black fluid thus obtained and called "Taszol" is used as "kohl" for painting the eyelids, the proper "kohl" being antimony.)

35. *Aquila rapax belisarius* (Lev.).

Falco belisarius ^{*}Levaillant, jun., *Expl. scient. Algérie, Ois.*, pl. ii (1850—plate without text! from a specimen obtained near Guelma in N.E. Algeria).

♀, Tanut, southern Aïr, 12.viii.1922. "Iris glassy, very pale stone brown. Bill black, pale whitish grey at base; nostrils white, feet creamish white."

This fine specimen, which appears to be adult, is as pallid as the one figured by Erlanger in *Journ f. Orn.*, 1898, pl. vii., which did not change and lives now, after twenty-six years, in Hilgert's care in Ingelheim, where I saw it only a few months ago.

If the three races, *A. rapax rapax*, *albicans*, and *belisarius*, are recognisable, this specimen undoubtedly belongs to *belisarius*. Cf. *Vög. pal. Fauna*, p. 1096.

36. *Circæstus gallicus* (Gm.).

Falco gallicus Gmelin, *Syst. Nat.*, i. 1, p. 259 (1788—"Habitat in Gallia, rarior in reliqua Europa").

♀ ad., Dan Kaba, northern Hausaland, 15.v.1922. Hausa name, "Bugazabi." This species is rare in tropical West Africa, but had already been

obtained by Poggiolini near Zaria, middle Hausaland. The date, middle of May, is interesting, as they breed at that time in Algeria, etc.

37. *Chelictinia riocourii* (Vieill.).

(*Nauclerus riocourii* auct., cf. *Ibis*, 1919, p. 692 !)

Elanoides riocourii Vieillot, in Vieillot & Oudart, *Gal. Ois.*, i. 1, p. 43, pl. xvi (1823—near Gorée, Senegal).

♂, near Tessawa, west of Zinder, 26.v.1922.

♀♀, Farak, Damergu, 14.vi.1922.

“♀: Iris clear red. Bill grey black, overlaid with chalky. Feet pale clean chalky yellow. ♂: Iris bright orange chrome, eyelids pale greenish. Bill dull greyish black, corners of mouth yellow. Feet chalky orange yellow, claws pale yellow.” Wings ♀ 237, 244, ♂ 231 mm. Hausa name, “shafo,” same as other hawks. Also observed near Gangara and in Damergu two years ago.

According to Sclater and Praed, *Ibis*, 1919, the characteristic longitudinal black patch on the underside of the wing is only to be found in the females. This seems to be correct, judging from the fact that the specimens without the black patch in the Tring Museum are smaller, but if this is so a number of ours (collected by Zaphiro) are wrongly sexed. The young birds collected by Zaphiro in southern Abyssinia have rust-coloured tips to the feathers of the upperside, white tips to the remiges, narrow grey-black shaft-lines to the breast, and a yellowish tinge on the chest. In 1886 I observed these graceful birds near Sokoto and Gandu, but was too ill to shoot any; Poggiolini, however, collected specimens near Zaria.

38. *Butastur rufipennis* (Sund.).

Poliornis rufipennis Sundevall, *Oefv. Ak. Förh.*, 1850, p. 131 (Khartum).

♂ ad., Kusada, N.W. of Kano, 30.iv.1922.

“Iris clear lemon yellow. Bill orange yellow with blue-black distal portion. Feet strong yellow.” Stomach full of locusts.

This find extends the known distribution of the Red-winged Hawk considerably. See Rchw., *Vög. Afr.*, i. p. 597; Sclater and Praed, *Ibis*, 1919, p. 693; van Someren, *Nov. Zool.*, 1922, p. 42.

39. *Circus macrourus* (Gm.).

♂ ad., Inzanenet, western Aïr, 26.i.1922.

“Iris clear bright yellow. Feet clear lemon yellow. Bill black, cere lemon yellow, corner of mouth pale green.”

40. *Melierax (Micronisus) gabar niger* (Vieill.).

Sparvius Niger Vieillot, in Bonnaterra et Vieillot, *Tabl. Enc. Méth., Orn.*, iii. p. 1269 (1823—Senegal).

Sparvius Leucorhous id., l.c. (1823—Senegal).

♀ ad., shot from nest with three eggs, Farniso, near Kano, 18.iv.1922.

♂ ad., melanistic, Dan Zabua, northern Hausaland, 30.iv.1922.

♀ ad., melanistic, Dan Kaba, northern Hausaland, 12.v.1922.

♂ juv., Farniso, near Kano, 3.iv.1922.

Iris of ad. ♂ grey, ♀ dark madder brown, ♂ juv. clear lemon yellow, melanistic ♂ very dark reddish brown, melanistic ♀ clear lemon yellow.

The three eggs are glossless white, looking through the hole against the light, dark sea-green. They measure 42×32 , 43×31.6 , 41.2×31.2 mm.

It is peculiar that the existence and distribution of the two subspecies of this species have hitherto not been worked out. Only Neumann has recognized them, as shown by labels in the Tring Museum, but he has dropped the matter again, and recently Kirke Swann has noticed them and discussed the question with me. The darker form inhabits South and East Africa, west to Angola and north to southern Abyssinia, the pale one Eritrea (northern Abyssinia), Nubia, and extends apparently west to the Senegal.

As both *Sparvius niger* and *leucorhous* were described from the Senegal, and *niger* stands first on the page, we shall have to adopt that name, which refers, of course, to the black variety. Probably *Accipiter erythrorhynchus* of Swainson and doubtless *Micronisus niloticus* of Sundevall are synonyms of this paler form, while *mitopus* Heugl. from Bogos probably belongs to it as well.

In the stomachs Buchanan found lizards.

The paler coloration of this northern subspecies is evident in all plumages. The black specimens are not so deep black and glossy as those from Gabun and South Africa; the adult grey ones have a paler upperside and paler bars on the abdomen, the young birds are lighter and less brightly coloured above and below.

41. *Melierax musicus neumanni* Hart.

(See *Nov. Zool.*, 1921, pp. 95, 96.)

♀ juv., beginning to moult, Tch Siderak, Asben (Air), 6.i.1923.

"Iris clear glassy cream-whitish. Bill blue-black, paling to grey base; cere and corners of mouth dull sienna. Feet medium full orange chrome, duller than usual." Tuareg name, "Amolen, Anulum, or Anola." Numerous grasshoppers and some mouse-hair found in stomach in 1920.

42. *Accipiter badius sphenurus* (Rüpp.).

♀ ad., Dan Kaba, northern Hausaland, 12.v.1922.

"Iris rich orange. Bill blue-black, cere and corner of mouth lemon yellow. Feet clear lemon yellow." Hausa name, "Kusarkama." A young ♂ was obtained near Kano in 1919, and Poggiolini had collected the species near Zaria.

43. *Falco peregrinus peleginoides* Temm.

♀ ad., Zarafokatin, in the Tassili of Ahaggar, 17.iii.1923.

"Iris dark umber, eye-skin full lemon yellow. Bill dark grey, gradually paling to greenish-yellow base. Cere full lemon yellow. Feet full lemon yellow. Developing eggs, one already with shell."

44. *Falco biarmicus abyssinicus* Neum.

♂ juv., Garabi, Tessawa, west of Zinder, 29.v.1922.

I suppose this must be *abyssinicus*, which nests in Hausaland, though I wish I could have examined an adult bird.

45. *Falco tinnunculus tinnunculus* L.

♀, Tch Siderak, Air, 7.i.1923. On upperside some old and some fresh feathers.

♀, Tamanrasset, Hoggar Mts., 27.iii.1923.

Clutch of two eggs of a Kestrel taken from a hole in a cliff, 23.vii.1922. The eggs were about five days incubated, containing small embryos. They are typical Kestrel's eggs, without gloss, the red patches somewhat light. They measure 39.5×32 and 39.3×31.2 mm. Unfortunately the parent birds were not shot, but they appeared to be the same as the birds shot. Though Geyr had the impression that Kestrels do not nest in the Hoggar Mountains, and I could not prove their nesting south of Ghardaïa, Geyr saw specimens near Idelès (Ahaggar), and I in In-salah as late as April 15th, and the species may as well nest sparingly in the Ahaggar (Hoggar) Mts. and in Aïr. It is of course *not impossible*, but not likely the case, that the tropical subspecies, *F. tinnunculus carlo* is the form which nests in Aïr, as it occurs near Zaria in Hausaland. The Hausa name is "Karamatta."

46. *Tyto alba affinis* (Blyth).

? *Strix poënsis* Fraser, *Proc. Zool. Mus. London.*, pt. x, 1842, p. 189 (1843—Fernando Po; cf. *Vög. pal. Fauna*, p. 1038, footnote).

Strix maculata (nec *Strix maculata* Vieillot, 1817, which is a South American Owl of the genus *Asio*) Brehm, *Vogelfang*, p. 40 (1855—"Nordostafrika," type from Khartum!).

Strix affinis Blyth, *Ibis*, 1862, p. 388 (Cape of Good Hope).

2 ♀, Dan Kaba, north Hausaland, 16.v.1922.

♀, Gamram, Damergu, 13.vi.1922.

♀, Farak, Damergu, 20.vi.1922.

♂, Inzanenet, western Aïr, 26.i.1923.

A few more were seen in open "Black Desert" a few days later, where rodents were abundant. In the Dan Kaba valley they were found in tropical forest. The ♀ from Gamram has much larger black-and-white spots on the upperside, and larger blackish spots underneath, and the underside is brownish yellow; it is thus a most typical "*maculata*," rectius *affinis*. The other specimens have smaller spots above and below, and the underside is silky white in the males, with a buff tinge on breast flanks and thighs in the female. Wings ♀ 292–301, ♂ 285–300 mm.

(A Barn Owl was observed near Tamanrasset, Ahaggar, probably *Tyto alba*?)

47. *Bubo africanus cinerascens* Guérin.

♂, Dan Kaba, northern Hausaland, 16.v.1922.

♀, Aouderas, Aïr, 1.x.1922.

♂, Timia, Aïr, 10.x.1922.

The specimen from Dan Kaba is more grey-brown, the two from Asben are more sandy-rufescent. The variations of this species are great; the reddest specimen I have seen is from Senafe, 7,500 feet, in Abyssinia, but it is darker, more rufous, on the abdomen, but on the upperside very much like the Timia bird, only a little darker.

48. *Bubo bubo desertorum* Erl.

Bubo ascalaphus desertorum Erlanger, *Orn. Monatsber.*, 1897, p. 192 ("Typus ex promontorio Sidi-ben-Aoun"), id., *Journ. f. Orn.*, 1898, p. 495, pl. xiii; Whitaker, *B. Tunisia*, ii. p. 80, and plate. *Bubo bubo desertorum* Hartert, *Vög. pal. Fauna*, pp. 970, 2194.

♂, Farak, Damergu, 20, 30.vi.1922.

♂, Melen, S.E. of Agades, 7.vii.1922.

♂, Inzanenet cliffs, W. Air, 25.i.1923.

"Iris clear yellow to full orange yellow. Bill dull bluish or greenish black. Feet whitish, claws blue-black."

These specimens vary in colour, but compared with a series from northern and middle Morocco, Algeria, Egypt, and Palestine proper they are much lighter, the facial disk is paler, the middle of the chest lighter, abdomen lighter, sometimes almost white, with narrower and sometimes indistinct cross-bars, the feathering of the tarsus and toes lighter, sometimes almost white, the upperside paler, but variable, wings 334–352 mm.

There is evidently no doubt that there is a southern paler subspecies, and to it, in my opinion, specimens from the Djebel Klima near Ghardaïa, from Kordofan (Brit. Mus.), from Shendy on the Nile (Nubia), and from Palmyra in the Syrian Desert, should belong. I am, however, somewhat uneasy about the name of this form, as, unfortunately, Erlanger described it from the southern slopes of the eastern Atlas Mts. in Tunisia, and specimens from there are not of the very palest form, in fact one from near Gabes, much further south, much more in the desert, agrees almost better with paler specimens of the northern darker form than with the real desert one, while another from the same locality is paler. On the other hand, both Erlanger and the careful Whitaker recognized a darker northern and a paler southern form, and I adopt, therefore, their name *desertorum*. The specimen from Azazga in the Kabylie, North Algeria, is undoubtedly one of the darker form (cf. *Vög. pal. Fauna*, p. 2194). Examples from Egypt are, of course, typical *ascalaphus*; it is true that we have from the pyramids darker and lighter examples, but subspecies must be judged by series, and not by single skins, and if we compare our very fine series from Morocco (all very dark), Algeria (except Ghardaïa), Egypt, and Palestine, with, on the other hand, those from Air (Asben), Shendy, Gabes, and Palmyra in the Syrian Desert, the two subspecies are obvious.

I continue to look upon *Bubo ascalaphus* as a subspecies of *Bubo bubo*. It is true that in northern Algeria specimens of both *Bubo bubo hispanus* and *ascalaphus* have been shot, and two forms occur in Palestine, but on the whole *ascalaphus* represents other Eagle-Owls in northern Africa, and we have no evidence that two different forms actually nest in the same places, though they meet in North Algeria and in Palestine occasionally.

49. *Otus senegalensis* (Swains.).

Scops capensis Smith, *S. Afr. Quart. Journ.*, ser. II. pt. iv. p. 314 (1834—South Africa, Cape Colony accepted as typical locality from the name).

Scops senegalensis Swainson, *Class. B.*, ii. p. 217 (1837—nomen nudum !), id., *B. W. Africa*, i. p. 127 (1837—Gambia, Rendall coll., type in Cambridge Museum examined by me, cf. *Vög. pal. Fauna*, p. 982, footnote, also Nachtrag, i. 1923).

♀ ad., Farniso, Kano, 20.iv.1922, with three eggs.

♂♀ pull., Dan Kaba, northern Hausaland, 17.v.1922.

♀ ad. "Iris pale greenish yellow. Bill and cere dull greyish. Feet greyish whitish." Iris of pulli "clear yellow." Eggs white, almost without gloss, hardly yellow, almost white, when looked through the hole against the light. Measures: 32.5 × 26, 33.5 × 26.2, 31 × 25.5 mm.

Hausa name, "Kururu."

This species must be called *Otus senegalensis*, as the combination *Otus capensis* cannot be used, because Smith, 1837, described the South African Brown Eared Owl as *Otus capensis*. Sclater and Stresemann wanted to discard this name, but they attacked the question at the wrong end. As I have already said, the name *capensis* cannot be used for the African Scops Owl, because the combination *Otus capensis* is preoccupied, but there is no reason whatever to reject the name *capensis* for the Brown Eared Owl, as there was no other *Otus capensis* in 1837 when Smith named it. The name *helvola* of Lichtenstein and *Asio tingitannus andrewsmithi* Sclater, 1922, are synonyms to *Asio capensis*.

I doubt if any subspecies of *O. senegalensis* can be separated, and am inclined to believe that *latipennis* Kaup (S. Africa), *pygmaea* Brehm (Sennaar), *ugandae* Neum. (Uganda), and *hendersoni* Cass. (Angola) are all the same.

50. *Otus scops scops* (L.).

Strix Scops Linnaeus, *Syst. Nat.*, ed. x. i. p. 92 (1758—"Habitat in Europa"; restricted typical locality, Italy).

♂, Bilma oasis, 6.xi.1922.

Of course a winter visitor.

51. *Otus leucotis leucotis* (Temm.).

Formerly only met with near Kano, but this time Buchanan also saw and shot one in Air.

♀ ad., Dan Kaba, northern Hausaland, 12.v.1922.

♂ pull., about three-quarters grown, Farniso near Kano, 25.iv.1922. Iris in both adult and young from Hausaland bright red.

♀ ad., Tebeig in Air, 26.vii.1922. Some time after death the iris was clear yellow.

The young birds are generally lighter and mostly more yellowish.

52. *Athene noctua solitudinis* subsp. nov.

Athene noctua subspeciebus *A. n. spilogaster* et *somaliensis* dictis simillimus, sed major, pilei maculis frequentibus rotundatis. Subspeciei *A. n. saharae* dictae similis sed minor, pilei maculis rotundatis, nec longiusculis, maculis pectoralibus brunnescentioribus, rostro grisescente, nec flavido.

♀, Mt. Todera, Air, 23.ix.1922. "Iris clear glassy pale lemon. Bill pale whitish grey-green. Feet dull medium blackish grey."

Though only this one specimen was obtained I must separate the Asben Little Owl. It is not *A. n. saharae*, because it is much smaller, bill smaller, wings shorter, crown not striped but with more or less round spots. Bill pale grey-green, not yellow! Very much like *A. n. somaliensis* and *spilogaster*, but larger, head regularly spotted, each feather with a pale centre, not uniform or slightly spotted as in *somaliensis* or striped as in *spilogaster*. The bill in *spilogaster* is said to be yellow, and it appears to be yellow in *somaliensis*. The colour of the upperside is rufous cinnamon clay-colour, and might be that of a rufescent *glauca* or a dark specimen of *saharae*. Wing 154, the first primary still growing, but the longest fully grown! Specimens of *A. n. somaliensis* have wings of 135-147 mm.; Erlanger quotes only 130-138, but some of ours are larger.

53. *Glaucidium perlatum* (Vieill.).

See *Nov. Zool.*, 1921, p. 99.

2 ♀ ad., Farniso, near Kano, 8, 10.iv.1922.

Hausa name, "Kururu."

I can only repeat what I said in 1921 about these birds. These two specimens are again both pale, but Senegal specimens are—though generally richer-coloured—sometimes equally pale. In one of these two the head is unspotted in the middle, but this occurs not rarely in other parts of Africa. It seems to me evident that specimens from South and East Africa have larger white spots on the head than those from Senegambia and Nigeria. (Cf. *Ibis*, 1915, p. 256; 1919, pp. 681, 682!)

The ♀ shot 10.iv had an egg in the oviduct. It has very little gloss, the inside is very faint yellow, and it measures 30.5×23.7 mm.

54. *Clamator jacobinus pica* (Hempr. & Ehrb.).

Cf. *Nov. Zool.*, 1915, p. 253; 1921, p. 99!

♂ ad., Tebeig, Aïr, 27.vii.1922. Wing, 161 mm.!

55. *Clamator glandarius* (L.).

♀ ad., Urufan, Tessawa, west of Zinder, 27.v.1922.

"Iris very dark grey. Bill brown-black. Feet brown-black with white joints." The Hausa at Katsena called it "Sura."

56. *Centropus senegalensis senegalensis* (L.).

Hausa name, "Rago-maza."

57. *Chrysococcyx caprius chrysochlorus* Heine.

♂ juv., Tarare River, Aïr, 6.ix.1922.

"Iris pale whitish brown. Bill brown, tinged with red, lower mandible and inside of mouth coral red. Feet grey-black with white scale joints."

Nov. Zool., 1921, pp. 100, 101, I have shown that the Senegal form, to which I restricted the name *chrysochlorus*, is much smaller than the South African one. *Bull. B.O. Club*, xlii. p. 119, Sclater quotes measurements of specimens from the Sudan, Shoa, Uganda, South Africa, Gold Coast, but he had no females, except five from the Sudan, and concludes that the British Museum series from West Africa "are not very good or well sexed, but it may easily be concluded that Dr. Hartert had hardly sufficient ground on which to separate two forms of the Didric. Anyhow, the Shoa bird should certainly be included with the South African race on the measurements given." It seems to me that Mr. Sclater has not read all my remarks, as I have pointed out that I separated the "North-West African and South African Golden Cuckoos," but that I could not go into the question of the East African and West African forms, and that I found Harrar birds intermediate between the two races which I admitted. As I had from South Africa 10 ♂ and 2 ♀, while Sclater had 9 ♂ and no ♀, as I had from the Senegal (Senegambia) 25 ♂ and 5 ♀, while Sclater had no Senegal specimens, and only

8 ♂, 5 ♀ from the "Sudan," 5 ♂ and no ♀ from Shoa, 4 ♂ and no ♀ from Uganda, 4 ♂ and 10 unsexed birds from Gold Coast, it seems to me that I was justified in my careful conclusion, while Sclater was not justified in considering that I had "hardly sufficient grounds on which to separate forms." Bannerman, *Nov. Zool.*, 1922, p. 416, endorsed Sclater's opinion, "and rejects my race"—but in support of his view he only quoted measurements of birds from "Upper Guinea," while I talked of Senegal birds, of which he had none. I therefore consider that Heine's name should be used for the Senegambian very much smaller race (Sundevall said already "*paullo minora*" of specimens supposed to be from Sennaar, but probably from the Senegal). The range of the Senegal form extends to Air (Asben).

58. *Crinifer piscator* (Bodd.).

(*Chizaerhis africana* auct., *Nov. Zool.*, 1921, p. 101.)

(Horror of horrors, our old friend *Chizaerhis africana* will in future be known as *Crinifer piscator*: cf. Bannerman, *Rev. Zool. Afr.*, x. 2, p. 117—ex W. L. Sclater MS.! *Crinifer* is a name of Jarocki, monotype *Phasianus africanus* Lath., as shown by Mathews & Iredale. *Falco piscator* Boddaert, *Tabl. Pl. Enl.*, p. 28, is a name bestowed on Daubenton's pl. 478, on which is represented a bird from Senegambia, obviously meant for our old *Chizaerhis africana*. I was at first inclined to reject this plate, because the tail is much too short, but as Mr. Sclater pointed out to me the peculiar bill is quite characteristic, the colour on the whole agrees well, and the tail is much foreshortened; the bill and the long occipital crest are well described by Buffon, and we must therefore overlook the much too rufous colour of the head, the shortness and the colour of the tail, and the descriptions of the habits, which were really meant for a bird of prey, but carelessly applied to this plantain-eater. It is difficult to understand that a bird with such a bill and such feet was thought to be a falcon!)

♀ ad., Dan Kaba, northern Nigeria, 11. v. 1922. In the stomach stones and berries of the "mugaia tree." The Hausas at Dan Kaba called the bird "Kulkulu."

Crinifer zonurus, with its quite differently shaped crest and very differently marked tail, must not be considered to be a subspecies of *C. piscator*.

59. *Poicephalus senegalus mesotypus* Rehw.

Poicephalus senegalus mesotypus Reichenow, *Orn. Monatsber.*, 1910, p. 174 (Adamaua).

Poicephalus senegalus versteri Hartert, *Nov. Zool.*, 1921, p. 101.

♂, Farniso, near Kano, 8. iv. 1922.

When writing in 1921 about 3 ♂ and 1 ♀ collected near Kano, I remarked that these birds were rather more like *versteri* than typical *senegalus*, and that a larger series might show that all Hausaland specimens were intermediate; I then overlooked that Reichenow had already given the name *mesotypus* to the intermediate birds from Adamaua, just south of Hausaland, and I suppose now that this subspecies is recognizable, since the ♂ now received is also intermediate, being too orange for *senegalus*, but not so bright as typical *versteri*; single specimens are apparently sometimes indistinguishable from *versteri*.

Hausa name, "Kalo."

60. *Psittacula krameri krameri* (Scop.).

(*Palaeornis krameri krameri* in *Nov. Zool.*, 1921, p. 102.)

♂, Dan Zabua, northern Hausaland, 29.iv.1922.

"Iris lemon yellow. Upper mandible rich mahogany-red, tip black. Feet pale greyish chalky white."

Hausa name, "Zibrea."

61. *Campethera punctuligera punctuligera* (Wagl.).

Picus punctatus Valenciennes (nec Vieillot 1818 !), *Dict. Sci. Nat.*, xl. p. 171 (1826—Senegal).

Picus punctuligerus Wagler, *Syst. Av.*, *Picus* species 36 (1827—"Senegambia"). (Bannerman, *Rev. Zool. Afric.*, x. fasc. 2, p. 99, 1922, mixed the quotations, as it was of course Vieillot who wrote in the *Nouv. Dict. d'Hist. Nat.*, 1818, and not Wagler !)

♀ ad., Dan Kaba, northern Nigeria, 16.v.1922. "Iris clear medium purple. Bill dull grey. Feet chalky green grey."

Hausa name, "Mokokofi," same as other Woodpeckers.

(The rare *Dendropicos minutus* (Temm.) (see *Nov. Zool.*, 1921, p. 103) was not collected this time, but I must call attention to the fact that the name *minutus* is untenable, as *Picus minutus* Temm. is anticipated by *Picus minutus* Latham, 1790; this little Woodpecker must therefore be called *Dendropicos elachus* Oberholser, *Proc. Biol. Soc. Washington*, xxxii. p. 8, 1919.)

62. *Mesopicos goertae*.

In *Nov. Zool.*, 1921, p. 102, I called all Woodpeckers of this group from Kano and from Air (Mt. Baguezan) *Mesopicos goertae goertae*. Now Buchanan sent us again a number of skins from Damergu and Air, and it looks as if all the latter belong to the very pale form described as *M. g. koenigi* from the Nile between Khartum and the Atbara! I would not hesitate for a moment to say that was the case, if our specimens from the Nile (Naikhala, Shendy, Atbara, N. C. Rothschild coll., Djebel Auli, and Shebesha on the White Nile, H. F. Witherby coll.) were not all in much abraded, worn plumage, killed from January to April, while our Senegal series is from December, one shot in May being also in fairly fresh plumage—and our Air series from May and June, all badly worn, while one from September 28 (Aouderas) in fresh garb is darker, the Kano specimens being all in fresh plumage, shot in December and January.* Nevertheless I think the two forms are separable, the pale one ranging from Nubia to Air, the darker one being restricted to Senegambia and neighbouring countries, as far as Kano. Specimens from middle and southern Hausaland (Zaria province and Loko on the Benné) are a shade darker than Senegal birds, and perhaps, as I said 1921, already belonging to *M. g. centralis*. They have no red or orange streak along the abdomen, but this character is not useful for recognising the various subspecies, as it is very variable. In any case, I now call the Air birds :

Mesopicos goertae koenigi Neum.

Mesopicos goertae koenigi Neumann, *Orn. Monatsber.*, 1903, p. 181 ("Am Nil zwischen der Atbara-mündung und Chartum").

In addition to those collected in 1920 Mr. Buchanan now sent the following specimens :

♂♀, Farak, Damergu, 19.vi.1922.

♀, Aouderas, Air, 28.ix.1922.

Hausa name, "Mokokofi"; Tuareg name, "Kow-kow eschkan," meaning "peck peck wood."

63. *Coracias naevia naevia* Daud.

Coracias naevia Daudin, *Traité, Orn.*, ii. p. 258 (1800—Senegal).

♂♀, Farniso, near Kano, 7, 8.iv.1922.

"Iris soiled white or umber with slight whitish outer ring. Bill dull black. Feet pale greenish yellow or dull medium yellow." Seen in open park country, perching on leafless trees, such as Baobab. Hausa name, "Zawanka" and "Zawaka."

64. *Eurystomus aler aler* (Lath.).

Coracias afra Latham, *Ind. Orn.*, i. p. 172 (1790—ex Latham, *Gen. Synops. Suppl.*, p. 86, "Africa," as terra typica accepted Senegal by Neumann, *Journ. f. Orn.*, 1905, p. 185).

♀, Dan Kaba, northern Hausaland, 9.v.1922.

"Iris dark brown. Bill full yellow. Feet sage-greenish brown."

("1710" is given by Bannerman as the date of Latham's work: this is obviously a misprint for 1790.)

65. *Merops orientalis viridissimus* Swains.

♀, Iberkan River, Aïr, 12.x.1922.

This species was also observed at Farniso near Kano and Dan Kaba. It is common in small flocks in Aïr.

Hausa name, "Kelyo"; Tuareg name, "Tasalahat."

66. *Colius macrourus syntactus* (Oberh.).

♀, Farak, Damergu, 18.vi.1922.

"Iris rich red, bare skin round eyes deep crimson." I can only repeat the remarks I made in *Nov. Zool.*, 1921, p. 106.

A small number were observed in the bush near the Farak wells. They were feeding on the round yellow berries of a light-green-leaved thorn bush, called by the Hausa "Mugaréa," by the Tuareg "Abuka" or "Asirratow." These berries ripen by the end of December on the river banks in Aïr. Sometimes they are red and about half an inch in diameter.

67. *Pogoniulus chrysoconus schubotzi* (Rehw.).

♂, Tabbello, Aïr, 20.x.1922.

♂, Monakaoki, Aïr, 9.xii.1922.

♀, Elmeki River, Aïr, 16.xii.1922.

Buchanan found it a rare bird, frequenting acacia-trees.

68. *Trachyphonus margaritatus margaritatus* (Cretzschm.).

The Tuareg (Tamashek) name is better spelt "Agishet N'owgur," and means the "Jackal bird," so called "because when it sees a jackal it gives out a loud rolling call and makes a great fuss" (Buchanan).

69. *Lybius vieilloti buchmanani* subsp. nov.

Lybius vieilloti frater, Nov. Zool., 1921, p. 107.

Subspeciei *Lybius vieilloti frater* dictae simillimus, sed colore rubro capitis dilutiore, magis scarlatino, alis paullo brevioribus.

♂, Tebeig, Aïr, 26.vii.1922.

♂♀, Tarabe River, Aïr, 6.ix.1922.

♂, Tchwana, Aïr, 20.vii.1922.

♂, Aouderas, Aïr, 15.ix.1922.

When I wrote about our specimens from Kano (Farniso), Zinder, Damergu, and Aïr, in 1921, I thought I must unite them with the N.E. African *L. v. frater*, but I now find that the specimens from Asben (Aïr), Damergu, and Zinder are distinguishable from *frater*, while the one from Farniso near Kano, like those from Zaria, belong to the W. African *L. v. vieilloti*.

Type: ♂ Tebeig in Aïr, 26.vii.1922.

L. v. buchmanani is certainly quite different from the Senegal form, *L. v. vieilloti*, the difference of which from *frater* I now appreciate more than two years ago, and it differs from both *L. v. vieilloti* and *frater* in the lighter, more scarlet red on the crown and sides of the head; as all our former specimens were in a somewhat abraded and faded condition, I attached no importance to this; in fact, it seems that the birds of Asben and Damergu fade rather quickly, in consequence probably of the glaring sun and amount of sunshine, and that their plumage becomes quickly worn. It is therefore somewhat difficult to say if the general paler appearance of these birds is a subspecific character or due to the amount of exposure and wear; in any case the tinge of the red on the head is not faded, as shown by fresh and old feathers; the edges of the remiges are apparently really paler yellow. The wings measure: ♂ 75, 78.5, 78, 79.5, 79, 80.5, 79.5; ♀ 76, 78, 79, 78, 76.5, 76 mm. The bills are sometimes, but not always smaller than in *L. v. frater*.

A ♀ taken on Mt. Baguezan in May had a fully developed egg in the ovary. A nest was found in the dead limb of a Dum Palm, but contained no eggs, though a female at Tarabe, in September, had eggs forming. Hausa name, "Tellu"; Tuareg name, "Arab." Often seen feeding on green parasitic plant on *Bagaru* acacias on river banks.

70. *Lybius dubius* (Gm.).

Bucco dubius Gmelin, *Syst. Nat.*, i. p. 409 (1788—"Habitat in maritimis Barbariae." Ex Buffon and *Pl. Enl.* 602. Loc. erroneous, must undoubtedly have come from Senegambia, which is to be looked upon as the typical locality).

♂, Farniso, near Kano, 7.iv.1922.

♀, Dowano, northern Hausaland, 27.iv.1922.

♂, Dan Zabua, North Hausaland, 29.iv.1922.

"Iris ♂ clear yellow or pale creamy brown, ♀ pale creamy brown. Bill sienna orange or pale sienna, whitish at tip. Feet pale sienna, dull whitish orange yellow." According to our material (Riggenbach collected many near Thiès in the Senegal colony) Shelley correctly thought that the blackish dots on the yellow patch on the upper abdomen are peculiar to the females; these patches are always mostly yellow, except in very old faded skins. It is artificial to make a separate genus, under the name of *Pogonorhynchus*, for the *Barbata*

with grooved lower mandibles, though the character at first seems easy to diagnose.¹

Buchanan found these birds frequenting larger trees in open park-like country, the "locust-bean tree" among others. The female had three half-sized eggs in the belly.

Hausa name, "Jendahooda."

71. *Halcyon chelicuti eremogiton* Hart.

♂, Farniso, near Kano, 15.iv.1922.

"Iris dark. Bill reddish black above, clear red below. Feet brownish above, reddish below."

Hausa name, "Süntara."

This additional specimen confirms the validity of this subspecies. Wing 75, bill 35 mm.

I must make use of this opportunity to again emphasize the striking differences of *H. chelicuti damarensis* from the small and pale form of Senegambia. The latter I cannot distinguish from the one from Eritrea, and I find that the wings of 27 Senegambian and 3 Eritrean specimens measure 75–79 mm., once 74, once 80, and only in one Eritrean male the wing is nearly 81 mm. In examples from Damaraland, Limpopo River, and Benguella the colour is darker, wings, back, scapulars blackish, rump deeper blue, bill much stronger, and wings 85–88 mm. As the type of *chelicuti* came from Chelicut in Abyssinia, near Antala and Makalle, on the same degree of longitude as Mokka in Arabia, I call the North Abyssinia-Senegambia form *H. chelicuti chelicuti*, the South-West African large one (Damara, Limpopo, Benguella) *H. chelicuti damarensis*. From nowhere else, however, does a series agree with either of these. All the birds from Harar and Somaliland, from East Africa (big series), the Congo, northern Angola, and Transvaal (where, however, some are rather large!) are intermediate in size, wings 80 to 83 mm., some 84, and as dark, or almost so, as *damarensis*! This form, or perhaps more correctly these forms, have no available name. Should they be named, or can we signify them, as *Halcyon chelicuti chelicuti* \geq *damarensis*? I think the latter would quite meet all requirements, as here, as in other cases, two extremes are connected by a series of intermediate forms. It is interesting that the species seems to be absent from Cape Colony and from Lower Nigeria! In the latter case it would be a conspicuous break between the Senegambian and Central African forms.

72. *Upupa epops epops* L.

♂, near Tamanrasset, Hoggar Mts., 23.iii.1923. Migrant.

73. *Irisor erythrorhynchus guineensis* Rehw.

Irisor erythrorhynchus guineensis Reichenow, *Orn. Monatsber.*, 1902, p. 79 (Portuguese Guinea to Niger. Type not stated).

♀, Farniso, near Kano, 10.iv.1922. Wing 135 mm.

♀, Farak, Damergu, 19.vi.1922. Wing about 135 mm.

¹ Apart from the striking similarity in colour and all other respects of "*Pogonorhynchus*" *dubius* and *Lybius bidentatus* and its subspecies it is significant that the young *dubius* has no indication of the grooves so obvious in the adults! Besides this, its black breast-band is wider and of a duller black.

"Iris dark. Bill coral red. Feet coral red."

♂ juv., Farniso, 24.iv.1922. "Bill black."

I agree with Bannerman (*Rev. Zool. Afr.*, x. p. 143, 1922) that the form *guineensis* must be kept separate from the black-billed *senegalensis*, at least for the time being, as all the evidence we have so far is pointing to the fact that *senegalensis* does not assume a red bill, while in all adult *guineensis* the bill is coral red. Probably a bigger series will show that the tail in *guineensis* is generally longer, while the wing is not. The undamaged tail of one of our females measures 236 mm. It seems to me that Reichenow did not see a specimen from Portuguese Guinea, but included this country in the range of *guineensis* because Fea shot red-billed adults there. These very interesting birds require further study. I look upon *guineensis* as a subspecies of *erythrorhynchus*, and I believe the black-billed *senegalensis* is also a form of it, but if two forms should occur together this view might require alteration.

Hausa name, "Jaba Koga."

74. *Scopelus aterrimus cryptostictus* Hart.

♂♀ ad., Tabbello, Aïr, 20.x.1922.

♀ ad., Tch Siderak, Aïr, 9.i.1923.

The ♂ has only a very faint indication of pale patches near the tips of the primaries, in the females they are obvious. Wing ♂ 103.5, ♀ 93, 94 mm.

Tuareg name, "Takadagot."

75. *Caprimulgus inornatus* Heugl.

4 ♂, 2 ♀, Farak, Damergu, 16, 20.vi.1922.

♀, Tebeig, south-eastern Aïr, 27.vii.1922.

♂, Tarabé river-bed, southern Aïr, 6.ix.1922.

♀, Aouderas, Aïr, 15.ix.1922.

This fine series illustrates most beautifully that the dark blackish grey, lighter dark grey, and the red form are individual varieties. (I do not use the usual term "phase," as it is ill applied, a phase being a changeable state, such as the phases of the moon.)

The ♂ 155 from Farak is the darkest, most blackish specimen known to me, another male from Farak is very slightly less dark, a third paler, a fourth and fifth have a reddish tinge, the sixth is as red as any specimen I have seen. This red is a sort of brick red. The three examples from Asben (Aïr) are reddish, one foxy or brick red, though not quite so bright as the reddest Aïr one, one lighter, more cinnamonaceous, but brighter and redder than cinnamon. It is apparently accidental that in the British Museum (see *Ibis*, 1919, p. 655) the red variety is more usually met with to the westward, as we have a red specimen, about as red as the reddest Farak bird, shot near Khartum by A. L. Butler, 28.v.1912.

76. *Caprimulgus europaeus europaeus* L.

Caprimulgus europaeus Linnaeus, *Syst. Nat.*, ed. x. i. p. 193 (1758—"Habitat in Europa et America"; restricted typical locality, Sweden, from first quotation. "America" erroneous).

♀ ad., Eluzzus River, Aïr, 7.x.1922.

"Feet dull brown-grey with white scale-joints." Migrant.

77. *Caprimulgus europaeus meridionalis* Hart.

Caprimulgus europaeus meridionalis Hartert, *Ibis*, 1896, p. 370 (South Europe and N.W. Africa; typical locality Greece, according to *Vög. pal. Fauna*, p. 848).

♂ juv., Bilma oasis, 6.xi.1922.

♂♂ juv. (? females), Bilma oasis, 7.xi.1922.

"Feet brownish skin colour." Migrant.

78. *Caprimulgus eximius simplicior* Hart.

♂, Urufan, Tessawa, west of Zinder, 28.v.1922.

♂♂, N.W. of Farak, Damergu, 22, 26.vi.1922.

♂, Tebeig, southern Aïr, 28.vii.1922.

Length in the flesh 9.5 to 10.5 inches. This fine series of this beautiful "Golden Nightjar" extends its range again, and the specimens confirm the differences stated in 1921. It was found in the same sort of desert or semi-desert, sand with dwarf bushes, as in 1920.

Hausa name, "Yotai," a name also applied to *C. inornatus*.

79. *Scotornis climacurus* (Vieill.).

Caprimulgus climacurus Vieillot, *Gal. Ois.*, i. p. 195, pl. 122 (1825—Senegal).

♂, Kusada, northern Hausaland, 30.iv.1922.

♀, Tessawa, west of Damergu, 25.v.1922.

"Iris dark. Bill flesh-colour, tip black. Feet greyish brown." The Kusada specimen is more brownish rufous, the Tessawa one more greyish on back and tail, more blackish on the scapulars and inner secondaries.

80. *Macrodipteryx longipennis* (Shaw).

Caprimulgus longipennis Shaw, *Nat. Misc.*, viii. pl. 265 and text (1796—Sierra Leone).

♀ juv., Tanut, southern Aïr, 15.viii.1922.

"Iris dark. Bill black, nostrils and corners of mouth dull pale brownish. Feet fairly dark blackish brown."

This specimen is very light and agrees with the description of *Caprimulgus houyi* Neumann, *Orn. Monatsber.*, 1915, p. 73 (Kamerun), which is nothing but young *Macrodipteryx longipennis*. As adult examples from West Africa and other parts of the continent are indistinguishable, we cannot even recognize a western subspecies of *M. longipennis*.

81. *Chaetura ussheri ussheri* Sharpe.

Chaetura ussheri Sharpe, *Ibis*, 1870, p. 482 (Cape Coast Castle, Fantee country, Gold Coast).

♀ ad., Farniso, near Kano, 7.iv.1922.

"Iris dark, bill black, feet brown-black."

Wing full grown, 155 mm.

Was shot flying over open cultivated country.

The specimen agrees well with the types in the British Museum, only being a little more black, probably due to the freshness of the plumage and specimen. The locality is very interesting!

It seems that *Chaetura ussheri senegalensis* Neumann, *Orn. Monatsber.*, 1915, p. 182 (Thiès, Senegambia), is not separable from *C. u. ussheri*. The Senegal

form is *not* larger ! Wings only quite exceptionally longer than 150, only once in over 20 adult birds 151.5 mm., mostly 144–150 mm., while other *ussheri* have wings 142–155 mm. (see above). There is no constant difference in the colour of the chin and throat and there are no black shaft-lines, though the feathers are narrowly edged in a varying degree. *Ch. ussheri sharpei* Neum. is a very distinct, well-marked form.

82. *Apus affinis galilejensis* (Antin.).

♂♀ Gangara, Damergu, 2.vi.1922.

I can only repeat what I said *Nov. Zool.*, 1921, p. 111, and 1915, p. 258. About my uniting the so-called "*koenigi*" with *galilejensis* quite a literature exists, but Bannerman (*Rev. Zool. Afr.*, x. 2, p. 133, 1922) seems to be somewhat doubtful about it. This gentleman calls the West African form "*Micropus affinis abyssinicus*," but does not explain how he separates it from *A. affinis* of India ; in spite of the extraordinary distribution I cannot see differences between West African and Indian specimens and must therefore reluctantly call the dark West African form *A. a. affinis*.

83. *Apus apus apus* (L.).

Hirundo Apus Linnaeus, *Syst. Nat.*, ed. x. i. p. 192 (1758—"Europa"; typical locality (restricted), Sweden).

♂ ad., Aouderas, Aïr, 3.ix.1922.

"Iris dark. Bill and feet black." Of course on migration.

84. *Apus pallidus pallidus* > *brehmorum*.

(*Apus murinus brehmorum*, *Nov. Zool.*, 1921, p. 110 ; cf. *Vög. pal. Fauna*, p. 2180 !)

(Sex ?), Aouderas, Aïr, 3.viii.1922.

♀, Tararat River, 11.ix.1922.

(Sex ?), Aouderas, Aïr, 18.ix.1922.

(Sex ?), Todera Mt., Aïr, 23.ix.1922.

4 ♂, Todera Mt., Aïr, 24, 25.ix.1922.

Although these birds and those collected in 1920 are in colour mostly a shade darker than *A. pallidus pallidus*, they agree better with the latter in size. I called them *brehmorum*? in 1921, but I would have done better to use the above formula. Here as in other cases a variable and partially intermediate form connects two distinct extremes, i.e. *A. p. pallidus* and *brehmorum*. While in a dozen *A. p. pallidus* the wings measure 160–167, in two specimens they range above 170, i.e. 172 and 173 mm., and in one 170. Now 14 Aïr Swifts have wings of 160–167, generally 162–165, but one shot 24.v.1920 has a wing of 172, another dated 25.ix.1922 a wing of 170 mm. They can therefore not be said to be smaller than typical *pallidus*, though being a shade darker. On the other hand, the wings of the usually still darker *A. pallidus brehmorum* measure as a rule over 170, and up to 180, quite exceptionally less than 170 mm. See *Nov. Zool.*, 1921, p. 111. Nesting on rocks in quantities on the Aouderas Mountains.

85. *Apus pallidus brehmorum* Hart.

♂, Tazeruk, Hoggar Mts., 19.iv.1923.

"Iris dark, bill black, feet blackish."

This specimen agrees in colour with nearly all the Aïr Mts. specimens,

but also with many Algerian and Tunisian specimens, and its wing measures a little over 176 mm. I therefore consider it to be typical *brehmorum* !

86. *Hirundo gordonii* Jard.

Hirundo gordonii Jardine, *Contr. Orn.*, 1851, p. 141 (Cape Coast Castle, Gold Coast, cf. *Contr. Orn.* 1849, p. 4 !).

♂♂ *en route* to Tessawa, at village called Guam Berka, Zinder Territory, 19.v.1922.

"Iris dark. Bill deep black. Feet deep brown-black."

The length of the wing is given much too small in Reichenow, *Vög. Afr.*, ii. p. 419. The wings measure 112 (seldom) to 122 (mostly 114–118), in one of our Guam Berka specimens 123, in the other 116 mm. This must be mentioned, as Reichenow in his "key," p. 402, separates *gordonii* from *semirufa* and *neumanni* with wings over 120, as having the wing under 120 mm. ! The larger specimen has the large white patches on the outer long rectrices, the smaller (perhaps a ♀, though sexed ♂ ?) has only a small whitish patch on the left outer, and no spot at all on the right outer rectrix !

87. *Hirundo albigularis aethiopica* Blanf.

Hirundo aethiopica Blanford, *Ann. & Mag. Nat. Hist.*, ser. iv. vol. iv. p. 329 (Nov. 1869—"Hab. in Abyssinia septentrionali, et in Nubia teste Heuglin"; types from Tigré in North Abyssinia).

2 ♂, Farniso, near Kano, 12.iv.1922.

"Iris dark, bill black, feet brown black."

88. *Hirundo rustica rustica* L.

Hirundo rustica Linnaeus, *Syst. Nat.*, ed. x. i. p. 191 (1758—"Habitat in Europae domibus intra tectum"; restricted typical locality, Sweden).

♂ ad., Aouderas, Aïr, 18.ix.1922.

♂ ad., Tamanrasset, Ahaggar Mts., 30.iii.1923.

♂ juv., Bilma oasis, 8.xi.1922.

At Tamanrasset "3 or 4" were seen altogether.

The Aïr specimen has a wing of 126, that from Tamanrasset only 117 mm. ! Under tail-coverts of both rufescent. The nesting of Swallows is not known south of Tuggurt and Temacin south of Tuggurt. They pass through the Sahara in small parties; neither Geyr, nor Buchanan, nor myself have seen large flocks anywhere. The remains of a young bird were picked up in the desert between Fachi and Tabella in eastern Aïr.

89. *Riparia obsoleta buchanani* Hart.

♀ ad., Tarabet River, Aïr, 12.ix.1922. "Eggs in ovary."

♂ ad., Todera Mt., Aïr, 23.ix.1922.

♂♀ pull., wings about two-thirds grown, Aouderas, Aïr, 2.viii.1922.

"Iris dark. Bill brownish, corners of mouth pale yellowish white. Feet pale skin colour."

The young have the upperside as in adults, but with cinnamon rufous edges to the feathers; the underside is rufous cinnamon, lightest on the throat, darker, tinged with dark grey on the flanks and lower abdomen, under tail-coverts widely edged with the colour of the breast; underside therefore very much like that of *fuligula*.

Riparia obsoleta buehanani is very closely allied to *Riparia obsoleta spatzi* (*Cotyle rupestris spatzi* Geyr von Schweppenbourg, *Orn. Monatsber.*, 1916, p. 59, Tuareg Mts.), but differs as follows: The upperside of *R. o. buehanani* is a shade darker; the underside is a little darker, especially on the flanks and lower abdomen; *R. o. buehanani* is smaller, the wings are shorter. Wings of *R. o. buehanani*, ♂ 112–115, ♀ 110–113, of *R. o. spatzi* 118–119, ♀ 119–121, according to Geyr even 118–125 mm.!

It was of course absolutely wrong that I (*Vög. pal. Fauna*, pp. 2176, 2177) called the Air Martin *R. o. buehanani* and the Hoggar (Ahaggar) Mts. form *R. rupestris spatzi*. Both are representatives of one and the same species; when I wrote that in 1921 I went by my recollection from a look at Geyr's specimens in Koenig's Museum and by his description, but now I have a series of each form before me.¹

I would very gladly agree that *R. rupestris* and *obsoleta* are subspecies of one species, even if they occurred in one or two places where their areas meet, but it seems to me that they occur together in vast regions of Baluchistan, East and South Persia, and in Palestine, and I must therefore adhere to my former opinion, although the similarity of these forms is great and most of their characters very variable.

Buehanan quotes as the Tuareg name in Air "Azurtitta," a name also used for the Swift, *Apus pallidus*.

On the Tarabet River in Air a nest made of red earth was found in the roof of an overhanging rock, September 6, 1922, containing two eggs. The eggs have a pure-white ground colour, without gloss; both have numerous tiny dots, some deep red, others reddish black, and a few small underlying mauve dots, and one has also some large pale rufous patches near the thick end. They measure 20.5 × 14 and 20.3 × 14 mm.

90. *Riparia obsoleta spatzi* (Geyr).

Cotyle rupestris spatzi Geyr. v. Schweppenbourg, *Orn. Monatsber.*, 1916, p. 59 (Tuareg Mountains).

♂ Tamanrasset, Ahaggar, 1.iv.1923.

♂♀♀, Een-Dali Wadi, Ahaggar Mts., 12.iv.1923.

♂♀, upper reaches of the Ideles river-bed, Ahaggar, 23.iv.1923.

"Iris dark. Bill black. Feet very dark blackish brown."

Tuareg name at Ideles, "Emister," also "Azurzur" and "Wa-sut-ta-fan."

91. *Phoenicurus phoenicurus phoenicurus* (L.).

♂, Tamanrasset, Ahaggar (Hoggar Mts.), 27.iii.1923.

♀, Bilma oasis, 7.xi.1922.

At Bilma a number were seen in the cultivated spot, at Tamanrasset a pair was noticed. Migrant.

92. *Oenanthe oenanthe oenanthe* (L.).

♂ Tamanrasset, Ahaggar, 1.iv.1923; a few others seen. A dried-up female (mummy) was picked up in the desert halfway between Fachi and Tabbello (eastern Air). Migrant.

¹ It seems to me that there are indeed, as suggested by Zedlitz, *Orn. Monatsber.*, 1908, p. 117, and in litt., two forms, but not as believed by him, the darker one inhabiting Persia, Afghanistan, Baluchistan, and Sind, the paler one Egypt, Sinai, and Palestine. The latter is the true *obsoleta*, the former, darker one *pallida* of Hume! This has already been suggested by Meinertzhagen in the *Ibis*.

93. *Oenanthe hispanica melanoleuca* (Güld.).

♀, Bilma oasis, 8.xi.1922.

It is interesting that the ♂ from Zinder shot in February 1920 is also of this subspecies. See *Nov. Zool.*, 1921, p. 113. Migrant.

94. *Oenanthe deserti deserti* (Temm.).

Saxicola deserti Temminck, Pl. Col. 359, Fig. 2 (1825—Nubia I!).

♂, In-Abbanganit, west of Aïr, 9.ii.1923.

♂, Inzanenet, West Air, 25.i.1923.

"Iris dark. Bill and feet deep black."

I have carefully compared these specimens, and I must certainly consider them to belong to the Nubian form, as they do not have the warm reddish hue on the upperside which we find in *O. deserti homochroa*, nor do they belong to the Asiatic subspecies. Whether they nest in the desert solitudes west of Aïr, we cannot say, but Buchanan noticed a few other solitary specimens in "the desolate country west of Aïr." *O. d. homochroa* does not seem to nest much south of Ouargla, according to all observations known.

95. *Oenanthe leucopyga aegra* Hart.

♂, Bilma oasis, 8.xi.1922.

♀, Tamanrasset, Ahaggar, 1.iv.1923.

Wing ♂ 104, ♀ 100 mm. The ♂ has two quite new black feathers in the white crown, that of the ♀ is spotless white; both are old birds with black wings.

There is of course no doubt that the West Saharan *aegra* is a smaller form, but some Nile Valley birds are not so big as most Palestine and Sinai birds; nevertheless the majority of the Nile valley birds are much larger than West-Saharan birds. The strong blue gloss of our series from Palestine and Sinai is probably due to their being autumn and early winter birds, while our West-Saharan birds are spring specimens, and it seems that they lose their blue gloss in the breeding season.

At Bilma a number were seen, and they were said to be resident there. In Aïr observed everywhere where there are rocks, and a few at Farak, the southernmost place where the species was seen. In the Ahaggar Tamashék it is called "Mola-mola"—"on account of the sound it makes"—but I have surely never heard it make a sound like that.

96. *Cercomela melanura airensis* Hart.

♀, Aouderas, Aïr, 28.ix.1922.

Juv., Iberkan River, near Timia, Aïr, 12.x.1922.

1 ♂, 2 ♀, Tebernit River, Aïr, 16.x.1922.

These specimens are in quite fresh plumage and differ from the series collected in May 1920 in having the upper side very slightly browner with pale-grey edges to the tips of the remiges. The ♀ from Aouderas has the upperside darker brown than any of the other specimens. The underside of all has a pinkish tinge, which is quite absent in the May specimens. The young bird is a bit more yellowish sandy on the upperside, otherwise like the adults.

These birds were generally seen in the same places as and often together

with *Oenanthe leucopyga aegra*. The Tuareg name is given as "takleet seni-seni." In September nearly all moulting and in bad plumage.

Cercomela melanura airensis was also found in Darfur by Admiral Lynes. While this form is easily distinguishable from Abyssinian and North Somaliland specimens, those from the Nile (see *Nov. Zool.*, 1921, p. 114) and the Red Sea coast near Suakim require further study; they seem to be very near *C. m. airensis* and either the latter or another unnamed subspecies.

97. *Saxicola rubetra rubetra* (L.).

Motacilla Rubetra Linnaeus, *Syst. Nat.*, ed. x. i. p. 186 (1758—Europe! Restricted typical locality, Sweden).

♂ ad., Taïfet, Ahaggar Mts., 13.iv.1923.

This specimen is decidedly of the very dark form, not of the pale *S. r. spatzi*, which we have found commonly in South Algeria and the northern Sahara. Dr. Grey observed Whinchats frequently as far south as Ahaggar, but omitted to collect any, so that it is impossible to say to which subspecies they belonged. As Whinchats do not nest in Algeria and Tunisia, nor in Dalmatia, *S. r. spatzi* is probably the form nesting in the Caucasus and elsewhere, and *noskae* is probably a synonym of *spatzi*. The difference between this dark specimen from the Ahaggar Mountains and the pale *spatzi* collected at the same time in South Algeria is so striking that one cannot doubt that there is a dark and a pale form, but the distribution of the latter requires further study.

98. *Monticola saxatilis* (L.).

Turdus saxatilis Linnaeus, *Syst. Nat.*, ed. xii. i. p. 294 (1766—"Hab. in Helvetiae, Austriae, Borussiae montibus"; restricted typical locality, Switzerland).

2 ♂ first autumn, Tebernit, Aïr, 16.x.1922, and Aouderas, Aïr, 29.ix.1922.

99. *Myrmecocichla aethiops buchanani* Rothsch.

2 ♂, Gangara, Damergu, 2.vi.1922.

These specimens, being in more worn, faded plumage, are still more brownish, paler, than those collected in January, March, and December in 1919 and 1920.

A number frequented the neighbourhood of the wells at Gangara, especially where there were some rough banks and many cattle droppings. Often seen in pairs or families, sometimes in company with *Spreo pulcher* (at Takukut, Damergu). Flight and habits seemed to Buchanan to be Thrush-like. Also seen at Dan Kaba. The Damergu Hausas called these birds "fairo."

100. *Cossypha verticalis verticalis* Hartl.

Cossypha verticalis Hartlaub, "Beitrag z. Orn. Westafrika's," first in *Verz. d. öffentl. und Privatvorles. Hamburg. akadem. Gymnasium, u.s.w.*, and in *Abhandl. a. d. Gebiete Naturw., herausgegeben vom naturw. Verein zu Hamburg*, vol. ii. 2, p. 23 (1850—Elmina on the Gold Coast).

2 ♂ Dan Kaba, north Hausaland, 16.v.1922.

"Iris dark brown. Bill deep black. Feet glazed dark brown." The white patch along the crown is distinctly wider in one of the two specimens. Riggensbach collected specimens near Thiès, Senegal colony.

Hausa name, "M'fadama," meaning that it lives on river banks.

101. *Turdoides fulvus buchanani* (Hart.).

(*Crateropus fulvus buchanani*, *Nov. Zool.*, 1921, p. 115.)

♂♂♀, Assode valley, Aïr, 19, 20, 21.i.1923.

"Iris ♂ fairly clear umber brown, ♀ white, speckled with stone-grey."

♂♂, Taïfet, Ahaggar (Hoggar Mts.), 13.iv.1923.

"Iris pale greyish white."

♀, Ten-a-curt, near Tamanrasset, Ahaggar, 25.iii.1923.

"Iris outer circle white with inner ridge of umber brown."

Wings ♂ 95, 97, ♀ about 97 mm. (all worn). According to Geyr, Hoggar specimens have wings of 93–99 mm.

After careful comparison I conclude that Hoggar specimens are indistinguishable from the Aïr ones. In 1912 I saw the last *Turdoides fulvus fulvus* near Tuggurt, and further west near El-Hadadra, Geyr saw them north of Ouargla near Hassi-Mahmar, then for 600 km. none, and again near In-Kelmet in the Tuareg Mts. Though the distance between the Hoggar Mts. and Aïr is also nearly 500 km. it is possible that there are connecting patches of thorn-bushes, to which the species is partial. Buchanan found it in "open desert with some scrub and grass tussocks," and remarks that he saw them mostly fly very low and often settle on the ground and run about the grass edges. It seems unavoidable to use Cretzschmar's name *Turdoides*, as it antedates *Crateropus*. Cf. *Proc. U.S. Nat. Mus.*, liii. p. 627.

102. *Turdoides plebejus anomalus* (Hart.).

Crateropus plebejus anomalus Hartert, *Nov. Zool.*, 1921, p. 116 (Farniso, near Kano).

4 ♂, 2 ♀, Farniso, April 1922.

These specimens are not in the beautiful fresh plumage in which the type, obtained in December is. They are all worn, some slightly paler on the upper-side. Wings ♂ 114–116, ♀ 105–108 mm. "Iris clear orange yellow, once rich orange yellow, once clear yellow."

Buchanan found these birds frequenting low thick leafless bush or thick green trees.

103. *Agrobates galactotes galactotes* (Temm.).

Sylvia galactotes Temminck, *Man. d'Orn.*, ed. ii. i. p. 182 (1820—South Spain).

♀, Tazeruk, Ahaggar (Hoggar Mts.), 18.iv.1923.

"Iris dark umber. Upper mandible grey-brownish, lower mandible whitish, tip of both blackish. Feet pale, slightly umber-brown." Another specimen observed.

The date is late for a migrant. Geyr has proved the breeding of the Rufous Warbler in Ouargla, I found it in the Oued Nça east of Ghardaïa, and it probably nests even in El-Golea. The breeding in the Hoggar Mts. is possible, but not known.

104. *Agrobates galactotes minor* (Cab.).

♀, Aouderas, Aïr, 31.viii.1922.

The nest of this bird was taken, Aouderas, 31.viii.1922, from a fork in the low bushes of the Abisgee tree. It contained three hard-set eggs, of which one was broken. The nest is somewhat flat and loosely constructed of stems of small

plants, leaves, rootlets, and grasses, also bark, and lined with finer material of the same kind and silky fibres; snake-skin, which is so often found in the nests of *A. galactotes galactotes* and *syriacus*, is absent. The two eggs measure 21×15 and 21.3×16 mm. In colour and structure they are exactly like the eggs of *A. g. galactotes*, but smaller than most of the latter.

105. *Hippolais pallida reiseri* Hilgert.

"♀," Aouderas, Aïr, 30.ix.1912.

Evidently a bird of the year and still moulting on body and wings, but mostly in beautiful fresh plumage; underside more yellowish buff than in spring specimens. Wing 64.5 mm.

106. *Hippolais pallida opaca* Cab.

Hypolais opaca Cabanis, *Mus. Hein.* i. p. 36 (1851—Senegal).

♀ ad., Tchwana, Aïr (Asben), 22.vii.1922.

"Iris dark. Upper mandible chiefly medium dark dull brown, edges and lower mandible dull yellowish white. Feet blackish brown."

In spite of the date (22.vii) doubtless a migrant, while *H. p. reiseri* nests in Aïr (*Nov. Zool.*, 1921, p. 117).

107. *Sylvia cantillans cantillans* (Pall.).

♂ ad., Tamanrasset, Ahaggar, 31.iii.1923.

Dr. Geyr had observed and shot this form in the Hoggar Mts., where it is surely only a migrant. Buchanan observed it in other places in Aïr and 3.iii.1923 at Tamengouit, N.W. of Iferouane in N. Aïr.

108. *Sylvia communis communis* Lath.

♂, Sersuf river-bed, Ahaggar (Hoggar), 16.iv.1923. On migration, of course.

109. *Sylvia hortensis hortensis* (Gm.).

♂, Eluzzus River, Aïr, 7.x.1922.

♂, Aouderas, Aïr, 29.ix.1922.

♂, Tazeruk, Ahaggar Mts., 18.iv.1923.

All on migration.

110. *Phylloscopus collybita collybita* (Vieill.).

Sylvia collybita Vieillot, *Nouv. Dict. d'Hist. Nat.*, nouv. éd., xi. p. 235 (1817—France).

♀, Tamanrasset, Ahaggar, 31.iii.1923.

"Feet very dark umber, almost black." Migrant.

111. *Phylloscopus trochilus trochilus* (L.).

Motacilla Trochilus Linnaeus, *Syst. Nat.*, ed. x. i. p. 188 (1758—"Habitat in Europa"; restricted typical locality, England—see *Vög. pal. Fauna*, p. 507).

♂, Tamanrasset, Ahaggar, 28.iii.1923.

"Feet full umber brown." Migrant.

112. *Spiloptila clamans* (Temm.).

♀, Tchwana, Aïr, 11.vii.1922.

At Tchwana Buchanan found this species plentiful. The Hausa names, "Siraquoa" and "Saboia," were given him at Tchwana.

113. *Eremomela flaviventris alexanderi* Scl. & Praed.

♂♀, Tchwana, Aïr, 11.vii.1922.

♂, Tagenjir River, Aïr, 13.x.1922.

♀?, Elmeki River, Aïr, 16.xii.1922.

♂, Tch Siderak, Aïr, 5.i.1923.

"Iris clear brown, clear umber, umber."

Also seen at Tigguedi. (Doubtful Hausa name given at Kano: "Materr Makerinjoja.")

114. *Sylvietta micrura brachyura* Lafr.

♀, Aouderas, Aïr, 30.ix.1922.

"Iris rich madder brown. Bill dark brown. Feet medium pale, slightly reddish, brown."

Wing only 52 mm., in ♀♀ from Zinder and Damergu 53, 53, ♂♂ 57, 60, "♂♀" (? both ♀) from Thiès, Senegal colony, 53, 53.5 mm.

Not before found in Asben (Aïr), three seen.

115. *Cisticola juncidis aridula* With.

(*Cisticola cisticola aridula*, Nov. Zool., 1921, p. 121.)

♂, Farniso, near Kano, 13.iv.1922.

A dark specimen, not like the type of *aridula*, but not as dark as the West African *uropygialis*. I am still convinced that this subspecies occurs light and dark, and that I am right in disagreeing with Messrs. Sclater & Praed's conclusions as set forth *Ibis*, 1918, p. 650.

Generally observed in bushes, but also seen on acacia-trees and in long grass.

116. *Hedydipna platara platara* (Vieill.).

4 ♂ ad., Tch Siderak, Aïr, 5.i.1923.

"Iris dark, bill and feet black." One still moulting on back and underside wings not yet moulted, the other three in perfect fresh plumage, breast and abdomen beautiful orange yellow.

Tuareg name, "Tagishit Nakowat."

117. *Nectarinia pulchella aegra* Hart.

2 ♂ ad., Gamram, Damergu, 13.vi.1922.

♂ ad., ♀, Farak, Damergu, 15.vi.1922.

"Iris dark, bill and feet black."

♂, Manakaoki, Aïr, 9.xii.1922.

This specimen has the long central rectrices, chin whitish, throat sulphur-yellow, without metallic feathers, but lesser upper wing-coverts metallic green.

♀?, Elmeki River, Aïr, 16.xii.1922.

♂ juv., Elmeki River, Aïr, 22.xii.1922.

♂, in winter plumage, Tch Siderak, Aïr, 31.xii.1922.

♀♂ (like the one from Manakaoki), Tchsiderak, Aïr, 2, 3.i.1923.

♂ (without long central rectrices), Tchsiderak, 7.i.1923.

♂ (like the Manakaoki), Tchsiderak, 9.i.1923.

Found plentiful about Gamram and Farak, in thickets of acacias in the depressions forming swamps in the rainy season.

Hausa name, "Muka'ding'jouji."

118. *Zosterops senegalensis senegalensis* Bp.

Zosterops senegalensis Bonaparte, *Consp. gen. Av.*, i. p. 399 (1850—"Africa occ. Senegal").

3 ♂, 2 ♀, Farniso, near Kano, April 1922.

"Iris clear brown. Bill black or dark grey-black. Feet pure medium grey."

Hausa name, "Kunin-Darouwa."

I take it that these specimens are typical *senegalensis*, of which we have a series collected by Riegenbach at Thiès, some of which are exactly like our Kano specimens. I believe, however, that Reichenow (*Vög. Afr.*, iii. p. 427) and Finsch (*Tierreich, Zosteropidae*, p. 25) have accepted a too wide distribution of this form, because our specimens from Sierra Leone are a little darker on the upperside, as is easily seen in the series. In that case the names *Zosterops demeryi* and *obsoleta* Büttik., based on Liberian specimens, would probably refer to this race, but it is somewhat doubtful if these names can be accepted; their description does not agree with any form of *senegalensis*, but the reason is (see Finsch, l.c.) that these specimens had been preserved in spirits and were discoloured! This seems to have been the case with the greater part of A. T. Demery's Liberian collections! This does not speak much for the nine months spent in the Leiden Museum (see *Notes Leyden Museum*, 1890, p. 197!), and it is difficult to understand that the fact of their being skins made from spirit specimens was not considered and not stated in print! Such skins have also been sold to various other museums and caused several other errors. Cf. among others *Nov. Zool.*, 1922, pp. 368 (No. 904) and 370 (No. 915).

119. *Remiz punctifrons* (Sund.).

♂♀, Farak, Damergu, 19, 28.vi.1922.

Only three seen on the second expedition.

120. *Tchitrea viridis ferreti* Guérin-Ménéville.

Tchitrea Ferreti Guérin-Ménéville, *Rev. Zool.*, 1843, p. 162 ("Abyssinie").

♂ ad., Gangara, Damergu, 18.v.1922.

"Iris dark, bare ring around eye cobalt blue. Bill medium cobalt blue. Feet medium cobalt blue."

The only specimen seen. It is a beautiful adult male, upperside white, but a few feathers on the uppermost back and on the rump partially rufous, tail 320 mm., white, shafts of central pair of rectrices 110 mm. black, shafts of the others chiefly, and outer edges of outer rectrices black; under tail-coverts white.

I am not sure if my nomenclature is correct, but I am convinced that these various long-tailed Fly-catchers are subspecies of one species. The oldest name is *Muscicapa viridis* P. L. S. Müller, *Natursyst. Suppl.*, p. 171 (1776—"Buffon," i.e. plate of Daubenton 573, fig. 2, and text). The name for the Senegal form is therefore *Tchitrea viridis viridis*, and Neumann (*Journ. f. Orn.* 1917, Band ii, p. 203) wrongly rejects this name, apparently under the impression that Müller's name is based on Brisson. Daubenton's figure, however, is a good representation of the Senegal form, and Swainson's description of his *Muscipeta melanogastra* is hardly much better than that of Buffon and Daubenton's figure.

Neumann assumes that the Senegal form never acquires a white plumage. I must adopt this view, as we received from Riegenbach ten adult males, and not one shows a trace of white, nor is a white male known from any other collector

from the Senegal, nor is there one among specimens collected on the Casamanze River. On the other hand, a single male from the Kaduna River in Hausaland shows traces of white on the tail, tail-coverts, and back, males from Gambaga are white, and in a most interesting series from the Amambara Creek, Lower Niger (Braham coll.), most males are white or partially white.¹ If, therefore, adult males remain rufous in Senegambia, the form in which the white males predominate, or at least regularly occur, cannot be called *T. v. viridis*, and I call Buchanan's bird *T. v. ferreti*, as there seems to be no difference between eastern adult males and this bird.

The range of *T. v. speciosa* = *duchailui*² is not quite certain. A specimen from the Kaduna River and one from the Amambara Creek, both immature males, show on the back an admixture of slate-colour, but we have no specimen from these parts with entirely or predominantly slaty upperside! Moreover, the Kaduna and Amambara specimens seem to have the longer, fuller crest of *T. v. viridis* and *ferreti*, not the shorter, narrower crest-feathers of *speciosa* = *duchailui*. The latter form (Ogowe River) has sometimes an entirely or partially black tail. The two instructive figures in the *Annals of the Congo Museum*, though supposed to be two "species" by Dubois, show the variation of such males.

In studying these forms it must be remembered that *T. v. viridis* always has the under tail-coverts chestnut-red like tail and back, while in *T. v. ferreti* they are pale rufous, whitish, or dull greyish. Of course I cannot say how they are in the red plumage in the form from Damergu. In the Kaduna specimen they are pale grey, tinged with reddish brown, but this bird is changing plumage!

121. *Muscicapa striata striata* (Pall.).

♀, Bilma oasis, 7.xi.1922.

♀, Taïfet, Ahaggar Mts., 14.vi.1923. Migrant.

122. *Muscicapa hypoleuca hypoleuca* (Pall.).

Motacilla hypoleuca Pallas, *Vroeg's Catal. Verzam. Vogelen, Adumbratiuncula*, p. 3 (1764—Holland).

♂ with grey-brown upperside, Taïfet, Ahaggar Mts., 13.iv.1923. Though the white at the base of the secondaries is very extended, this specimen seems to be typical *hypoleuca*, and not *speculigera*. Migrant.

123. *Lanius excubitor leucopygos* Hempr. & Ehr.

A nest was found south of Agades, 6.viii.1922. The nest was built in a small thorny acacia bush. It is built like other Shrikes' nests, especially like those of *L. e. elegans* in the Algerian Sahara, lined with pieces of soft bark, wool, and a few feathers. The two eggs dull creamy white, spotted with somewhat pale brown and pale mauve deeper-lying spots; they are thus like some eggs of *L. e. elegans*, but measure only 24.5×17.7 and 24.5×18.2 mm.

¹ Unfortunately Mr. Bannerman in his excellent work on the Birds of Southern Nigeria did not utilize the material in the Tring Museum, and left unmentioned a number of species represented in the Tring Museum from southern Nigeria!

² The name *speciosa* stands before that of *duchailui*, *Proc. Acad. Philadelphia*, 1859, p. 48, and there can be no doubt that this partially black-tailed bird is only a phase (here the word is correct!) of what is called *duchailui*. Moreover, this race appears to extend over the Congo Basin to Lake Kivu, and to Kamerun, and Reichenow's *melanura* is a synonym of *speciosa*! We have a ♂ with quite black tail, upper tail-coverts black with white tips, from the Ogowe, and others with partially black and white tails.

Tuareg name, "Agishet Daren." Observed near Arufan, north of Tessawa, 27.v.1922. A head with feathers picked up in desert between Air and Fachi.

124. *Lanius senator senator* L.

Juv. Assada, Air, 5.x.1922.

♂ ad., in moult (wings, tail, body above and below), but mostly in old faded plumage, consequently rufous head and neck very pale, Tarabe River, Air, 6.ix.1922.

♀ ad., Tamanrasset, Ahaggar, 27.iii.1923. A very fine adult bird.

Mr. Buchanan believes that Red-headed Shrikes nest in Air, and the natives told him it did. I do *not* think so; young Shrikes often cross the Sahara in juvenile plumage. Tuareg name, "Erruff Wurtulemer," which means, "No, not a camel." The Targi say the bird looks at strangers in the bush and then says as above.

125. *Harpolestes senegalus senegalus* (L.).

3 ad., Farniso, near Kano, 15, 17, 18.iv.1922, all three in worn plumage.

126. *Laniarius barbarus barbarus* (L.).

4 ♂, 2 ♀, Farniso, April 1922.

"Iris dark umber. Bill deep black. Feet medium leaden grey."

I cannot separate these specimens from a Senegal series, collected by Riegenbach. The unusually dark crown of the specimen shot at Farniso, 27.xii.1919, is doubtless accidental, as the crowns of the six specimens shot in 1922 are like those of Senegal birds.

Frequenting low thick bush. Hausa, "Kojay." Buchanan says it "has a clear deep long ratchet-sounding call note."

127. *Nilaus afer afer* (Lath.).

♂, Tebernit, Air, 16.x.1922.

128. *Prionops plumatus haussarum* Hart.

4 ♂♀, Farniso, near Kano, April 1922.

"Iris and naked skin round eye bright or clear lemon yellow, but in one male bright brown."

These specimens fully confirm the difference of the subspecies *haussarum*.

129. *Corvinella corvina corvina* (Shaw).

Lanius corvinus Shaw, *Gen. Zool.*, vii. pt. ii. p. 337 (1809—ex Levaillant, locality unknown; I regard Senegal as the typical locality, as the most likely place it must have come from—at the end of the eighteenth century).

3 ♂, 2 ♀, Dan Kaba, northern Hausaland, 9, 10.v.1922.

"Iris dark brown with a yellow eyelid-ring. Bill full yellow, once orange yellow. Feet dark greyish black, underside and at 'knee' green."

Hausa name, "Jabebi."

These specimens agree with Senegal ones. Seen frequenting trees in Dan Kaba valley.

130. *Motacilla flava cinereocapilla* Savi.

Motacilla cinereocapilla Savi, *Nuovo Giornale dei Letterati*, No. 57, p. 190 (1831—Italy).

♂ ad., Ten-a-Curt near Tamanrasset, Ahaggar, 23.iii.1923.

This specimen has an indication of a narrow white superciliary line, but this is sometimes found in *M. f. cinereocapilla* and nearly always well developed in *M. f. iberiae*. (Cf. *Vög. pal. Fauna*, p. 2097, 1921; *Nov. Zool.*, 1923, p. 99.) Migrant.

131. *Motacilla alba alba* L.

♂ ad., Bilma oasis, 9.xi.1922. Migrant.

132. *Anthus campestris campestris* (L.).

♂, Tamanrasset, Ahaggar, 31.iii.1923.

Small crickets and other insects in stomach. Migrant.

133. *Anthus trivialis trivialis* (L.).

♀, Eluzzus River, Aïr, 7.x.1922.

♀, Bilma oasis, 7.xi.1922.

♂, Ten-a-Curt, near Tamanrasset, Ahaggar, 24.iii.1923. This last has exceptionally long hind claws, measuring in a straight line nearly as much as the hind toe; the pectoral spots are rather small, the upperside is browner than in the autumn specimens. Migrant.

134. *Anthus cervinus* (Pall.).

Motacilla Cervina Pallas, *Zoogr. Rosso-Asiat.*, i. p. 511 (1827—Eastern—most Siberia).

Tazeruk, Ahaggar Mts., 18.iv.1923.

"Iris dark; bill brown-blackish with paler parts brownish yellow; feet medium umber brown, slightly golden."

Geyr and Spatz found the Red-throated Pipit once in the Hoggar (Ahaggar) Mts., and as it is not very rare on spring passage in southern Algeria and Tunisia and has been found in southern Morocco, near Mogador, in winter, it probably winters there regularly, though in small numbers.

135. *Alaemon alaudipes alaudipes* (Desf.).

♂ ad., Melen, S.E. of Agades, 6.vii.1922.

♂ ad., Tebeig, Aïr, 25.vii.1922.

♂ ad., ♂ juv., Igadayan, West Aïr, 29.i.1923.

♂ ad., Takkarech, West Aïr, 30.i.1923.

♀ ad., In-Abbangerit, west of Aïr, 9.ii.1923.

♂ ad., In-Abbangerit, west of Aïr, 12.ii.1923.

♂ ad., near Idelès river-bed, Ahaggar Mts., 24.iv.1923.

This series is surprisingly uniform, rather sandy-brownish on the upperside, the top of the head not greyish, but brownish, darker than the back and faintly striated. In other countries (Tunisia, Algeria, Egypt) there is considerable variation; it would therefore be hazardous and unwise to bestow a name on these southern birds, as they may vary in the same manner as the northern ones, though our present small material does not show it.

The Targi in Aïr called this bird "Zunkusharat," in Ahaggar "Towler-y-din."

Geyr's Tuareg called the "Muka" of the Arabs "N-ged-edara." Buchanan tells us that in Tuareg folklore the "Muka" is regarded as an evil bird, because on account of its usual short flight boys think they can easily catch it and are thus led away into the desert without watching where they go, until they are lost. It is easily conceivable that such a tame, conspicuous bird, with such a beautiful song, gives rise to folklore, and Koenig related a very pretty fairy-tale about it in *Journ. f. Orn.*, 1895, p. 437.

136. *Mirafr erythropygia* (Strickl.).

Alauda erythropygia Strickland, *Proc. Zool. Soc. London*, 1850, p. 219 (Kordofan, Petherick coll.).

♂, Tanut, south Aïr, 11.viii.1922.

1 sex? Marandet, southern Aïr, 16.viii.1922.

♀, Arrili Hill, Afara valley, S.W. of Agades, southern Aïr, 20.viii.1922.

"Iris dark brown. Bill blackish, basal half of lower and cutting edges of upper mandible."

There are not very many specimens in collections of this rare Lark, but among those in the British and Tring Museums are two very different varieties, one with the outer webs of the primaries broadly edged with cinnamon-rufous and the basal two-thirds (about) of the inner webs rufous or rufescent, the other without or with only a narrow outer rufous border and without any rufous on the inner webs. After examining the specimens collected by A. L. Butler in the Upper Nile province, Bahr-el-Ghazal, and Lado Enclave, our skin from Gambaga (Giffard coll.), and the three sent by Buchanan, I come to the conclusion that the specimens with the wide rufous outer and inner area of the primaries are females and young, those without the rufous on the primaries adult males, and that adult specimens with the great amount of rufous labelled "♂" are wrongly marked as males. These variations in the colour of the primaries have duly been noticed by Heuglin and Shelley (*B. Afr.*, iii. p. 74), and Heuglin described the bird with the rufous on the primaries as *Melanocorypha infuscata* from Bongo. These differences cannot very well be individual, nor are there two distinct species, and they must be sexual! The darker colour of the Bahr-el-Ghazal specimens mentioned by Sclater & Præd (*Ibis*, 1918, p. 606) appears to be due to the state of their plumage.

The ♂ from Tanut has fresh body plumage only partially still moulting, and moults quills and rectrices. The fresh feathers are much more black than the old ones; those of the upperside have creamy-cinnamon edges. The Marandet specimen, which must be a ♂, is like the one from Tanut and similarly moulting. The ♀ from the Arrili Hill is also in moult, but the tail, primaries, and greater part of body plumage is still in the old, faded plumage.

137. *Mirafr cheniana chadensis* Alex.

Mirafr chadensis Alexander, *Bull. B.O. Club*, xxi. p. 89 (1908—Kowa Baga, on Lake Chad).

♀, Urufan, Tessawa, west of Zinder, 28.v.1922.

♂, S.W. of Agades, south Aïr, 7.viii.1922.

♂♂♀, Marandet, south Aïr, 9.viii.1922.

♂ ad., ♀ juv., Assada, Aïr, 5.x.1922.

"Iris umber brown. Crown of upper mandible umber brown, remainder of bill pale greyish white. Feet pale flesh colour."

These specimens agree with Alexander's *M. chadensis*. They are a very pale form of *M. c. simplex* and the spots on the jugulum are much smaller, the flanks unstriped. The original description is bad, the edges to the wing-coverts and secondaries not being white, but buff, not at all lighter than in *M. c. simplex*, which is very near to *cantillans*, but different. The oldest name is, however, *cheniana*, of which *simplex*, *chadensis*, and *cantillans* are subspecies. The young ♀ is on the upperside pale yellowish sandy-buff, lighter than adults, each feather with a very light edge and a dark-brown spot before the tip, the jugular spots are very small and not well developed. Wings ♂ 79, 80, 80, 81, 83, ♀ 76 mm. Two Darfur males (Lynes coll.) have wings of 79.5 and 80.5 mm. A nest was taken in the Tarare valley, Aïr, 6.ix.1922. It contained four fresh eggs. The eggs are smooth and glossy, ground-colour whitish, thickly but finely spotted with dark brown, much closer on the thick end, which is thus very much darker, and indistinct underlying paler greyish-brown spots. They measure 18×14 , 19×14.8 , 19.5×14 , 19×13.8 mm. The nest consists of fine grass and other small plant stems, finest inside.

Another nest with four eggs was found in the Afara valley, S.W. Aïr, 20.viii.1922. It was placed in a grassy valley, in a tuft of grass, hooded over so as to be protected from rain and sun, built of the same material as the other. The eggs are moderately, not quite so strongly, glossed as the others, and less longitudinal, thicker. They are so thickly covered with brown that little is visible of the brownish-white ground colour, the spots forming a dark zone near the broad end, which in one egg is quite greyish. They measure 18.4×14.5 , 18.5×15 , 18.5×14.5 , 17.5×15 mm.

The occurrence of this *Mirafra* in Asben (Aïr) extends its range farther westwards, and Admiral Lynes collected specimens in Darfur. It is therefore a bird of the middle of the southern Sahara.

At Katsena the Hausa name, "Dan Kajerkaja," was given. A young lark from Aouderas, 2.x.1922, just from the nest, wings about two-thirds grown, is the young of this species (not of an *Eremopterix* as the collector believed). The upperside, including the quills, is pale brown, each feather with a buff border and a blackish ante-apical mark. Underside cream-colour, sides of head and jugulum with brown spots. "Iris umber-brown. Upper mandible pale brownish, lower mandible blackish! Feet very pale skin-brown."

138. *Galerida cristata alexanderi* Neum.

♂♀. Farak, Damergu, 29.vi.1922.

♂♂, Ouna River, east of Aouderas, foot of Baguezan Mts., Aïr, 18.x.1922.

♂, ? ♀ juv., Aouderas, 13.ix.1922.

In *Nov. Zool.*, 1921, pp. 129, 130, I have discussed the variation in the specimens formerly collected by Captain Buchanan. The two specimens from Farak, where the rocks and general surroundings are very similar to those of Aïr, are in absolutely fresh plumage, some body feathers, tail, and primaries of the female still growing. They are beautifully rufous, especially on the forehead, the spots on the jugulum not standing out very sharply, because the pale edges of the feathers hide them somewhat. The two from the Ouna River are worn and not so rufescent, one specimen much paler than the other, the jugular spots stand out sharper, the edges of their feathers being worn off. The young birds are, of those forms of the species of which I have young before me, nearest

to those of *G. c. macrorhyncha* and *arenicola*, but less rufescent, the secondaries and dark spots to the feathers of the back darker. As I have remarked elsewhere, the young of the various subspecies of Crested Larks differ generally quite as much as the adults. Buchanan says the Hausa name is better pronounced "Daila." Tuareg name "Misunko," because the bird is like a Tuareg boy-child with his hair cut in the form of a crest.

139. *Ammomanes deserti mya* Hart. (?).

(*Ammomanes deserti mya* > *geyri*.)

♂♂♀, Tchwana, Aïr, 12.vii.1922.

♂, Aouderas, Aïr, 20.x.1922.

♀, Tamanrasset, Ahaggar, 1.iv.1923.

♂♂, Een-dal-i-Wadi, Ahaggar (Hoggar) Mts., 12.iv.1923. Though we have now beautifully freshly moulted Aïr specimens, I prefer still to add a query to these birds, because I have no equally freshly moulted Oued-Mya specimens! As I was there only in the spring months I could only obtain worn specimens. The Tamanrasset (Ahaggar) specimens are slightly more grey-brown than the topotypical Oued-Mya ones, though almost as much worn, but some of the latter can hardly be distinguished at all. Moreover, some of the Aïr specimens in fresh autumn plumage are so much like fresh autumn examples of *A. d. algeriensis* that one could not distinguish them; as the spring birds of *A. d. algeriensis* are mostly exactly like *A. d. mya* in colour, differing only in size (length of wing, thickness of bill), I presume that topotypical *A. d. mya* will look like *algeriensis* in the autumn—but the majority from Aïr are darker than *algeriensis*, thus being somewhat intermediate between *A. d. mya* and *A. d. geyri* hereafter described.

A nest with two eggs, slightly incubated, was found on the upper reaches of the Idelès River, Ahaggar, 23.iv.1923. The nest was placed in the shade of a stone about one foot in size and was banked up with a terrace of stones about $\frac{1}{2}$ to $\frac{3}{4}$ in. in size, which had been placed there by the bird (cf. *Nov. Zool.*, xx. p. 43). The nest is a typical *Ammomanes* nest, fairly flat, consisting of stems of grass and other small plants, fibres and string-like strips of cotton garments, lined with finer material, and wool. The eggs are white, spotted and sprinkled with brown and very few paler, slightly greyish underlying spots. They measure 21.7×15.3 and 22×15.7 mm. These two eggs are exactly like specimens of the lighter variety of eggs of *A. deserti algeriensis*.

At Aouderas these birds were called by the Targi "A Bōkova," also "Ebakorian-Mallam" (Mallam meaning a priest), "so named because they rob no one, eating seeds dropped by the roadside, and do not interfere with homes." In Ahaggar the Tuareg called them "Ti-ga-der or Tigadirt and Taba-how-it." These birds abound everywhere in Aïr proper. They frequent level stretches of bare stones and pebbles and are found among the huge boulders on the mountains.

140. *Ammomanes deserti geyri* subsp. nov.

Persimilis speciminibus subspeciei *Ammomanes deserti mya* (?) dictis ex montibus Aïr, sed colore supra saturatiore, rostro fortiore, maculis griseis gutturis magnis.

♂, ♀♀? Farak, Damergu, 29.vi.1922.

" Iris umber-brown. Bill brownish, edges of upper and whole lower mandible lemon-yellow."

These specimens are in moult on wings and tail, the body plumage freshly moulted. The upperside is deeper and slightly more greyish brown than in fresh Air specimens, the spots on the throat and jugulum are more extended, the bills are thicker. The wings are in moult and can therefore not be measured satisfactorily. Type ♂ No. 148. Named after Dr. Geyr von Schweppenburg, the first ornithological explorer of Ahaggar.

The Air (Asben) form might be looked upon as intermediate between *A. d. mya* and *A. d. geyri*, and, if it is wise and possible to judge from three worn specimens, the Ahaggar (Hoggar) examples are nearest to topotypical *mya*! The cliffs at Farak are very similar to those of Air (Asben), this being the only similar mountainous part of Damergu. Not observed anywhere else. The dark coloration of the Farak birds was noticed in life.

141. *Ammomanes phoenicurus arenicolor* (Sund.).

♂♂♀, Agades, southern Air, 5.viii.1922.

♂♀, Oued Emoona, north Ahaggar, 28.iv.1923.

I cannot separate these specimens from typical *arenicolor*. The size of the bill is somewhat variable. Perhaps examples from Lower Egypt and Sollum (Meinertzhagen coll.) are somewhat more greyish, but apparently some Algerian ones are equally grey; unfortunately we have no western specimens in quite fresh autumn plumage.

142. *Calendula dunni* Shell.

Calendula dunni Shelley, *Bull. B.O. Club*, xiv. p. 82 (1904—"Ogagah, Sudan," more exactly Ogagah Wells in Kordofan).

Calendula dunni pallidior Hartert, *Nov. Zool.*, 1921, p. 130 (Damergu).

♂♀, Tanut, southern Air, 15.viii.1922. Wings ♂ 85 mm., ♀ moulting.

"♂," Marandet, southern Air, 16.viii.1922. Wing 81 mm.

The iris of all three specimens is marked as "dark."

These specimens in nearly fresh plumage show that the pale colour of the Takukut (Damergu) specimens collected by Captain Buchanan in 1920 was due to their being in worn plumage, and that "*Calendula dunni pallidior*" is not separable. The hope I expressed in 1921, that Admiral Lynes would come across the species in Darfur, has been fulfilled, and his specimens helped me to see that the form from Damergu and Air is not different. The bill varies somewhat in size and is apparently longer in males, slightly shorter but stouter in females. The Marandet specimen shows distinct, though short and narrow streaks on the jugulum.

143. *Calandrella brachydactyla hermonensis* Tristr.

(Cf. *Nov. Zool.*, 1921, p. 130.)

♂♂, Igadayan, western Air, 29.i.1923.

♀, Tamat-Teddert, west of the Air Mts., 31.i.1923. These specimens have the crown very distinctly striped and of almost the same colour as the back. In spring the heads are more reddish, the stripes appearing shorter when tips of feathers are worn off. Numbers were seen west of Air.

144. *Eremopterix leucotis melanocephala* (Licht.).

♂ in full moult, Gangara, Damergu, 5.vi.1922.

5 ♀, 3 ♂ in full fresh plumage and partly still moulting, Tanut, Damergu, 10.vi.1922.

(About the generic name see *Nov. Zool.*, 1915, p. 264.)

The males have no black patch on the lesser upper wing-coverts—cf. *Nov. Zool.*, 1921, p. 131. It seems to me that the western birds, which seem to lack the black patch *always*, should have a new name, but in the British Museum the majority of Nubian birds are exactly like the western (Senegal) birds. I therefore refrain for the present from naming the latter.

Freshly moulted specimens are much darker chestnut on the upperside, this colour fading considerably during the breeding season, and the lesser upper wing-coverts become pure white.

Observed also at Dan Kaba, Hausa name "Agali-Kusuru."

145. *Eremopterix frontalis frontalis* (Bp.).

♀, Farak, Damergu, 16.vi.1922. Body plumage in moult, fresh feathers darker and more rufescent than afterwards.

♂♀ ad., Tebeig, Air, 26.vii.1922.

2 ♂ ad., Aouderas, Air, 30.ix.1922.

Hausa name the same as that of *E. leucotis melanocephala*.

A nest with three eggs was found at Tarare, near Aouderas, 4.ix.1922, among stony hills, on the ground at the roots of a tussock of grass (the grass called "Amassa" by the Tuareg). The nest was cup-shaped and placed in a hollow depression; it consisted of fibres and grass. The eggs are white with not very dark rufous-brown spots and patches and very few underlying greyish patches. They are but little more pointed at the thin end, and measure 19×13.5 , 19.5×13.7 , 19.3×13.8 mm.

146. *Emberiza flaviventris flavigaster* Cretzschm.

Emberiza flavigaster Cretzschmar, *Atlas Reise Rüppells N.O. Afr., Vög.*, pl. xxv. p. 38 (1826—Kordofan).

2 ♂, 1 ♀, Dan Kaba, N. of Katsena, northern Hausaland, 10.v.1922.

"Iris dark. Bill dull black, upper mandible brown-black, lower pale fleshy brown. Feet pale medium brown."

Hausa name, "Kudaku."

These specimens agree with specimens from Eritrea (Schrader), and from Kordofan, Sennaar, and Kassala province in the British Museum. They are usually slightly smaller than *E. f. flaviventris*, and very little paler, but fresh feathers are much darker than old faded ones. The principal difference is the less extent of yellow on the breast, and paler sides, as pointed out by Witherby, *Ibis*, 1901, p. 246, who first separated this subspecies, while Reichenow, in 1904, did not come to a decision.

The birds shot by Buchanan frequented low scrub "of the sub-desert type." "Song (not much more than a call) like peep-whur-r-r, peep-whur-r-r, peep-whurr; when calling the crest-feathers were slightly erected."

147. *Emberiza striolata sahari* Levaill.

♂, Tamanrasset, Ahaggar, 30.iii.1923.

"In the hills north of Agades very plentiful. The only common bird about the Fort of Tamanrasset at the end of March. They have a chirp somewhat like a Sparrow and a sweet song."

A nest composed of dry grasses and camel's hair was found in a hole in a stone wall of a deserted hut at Aguellal, 6.vi.1920. It contained three eggs.

A nest with four eggs was found at Aouderas, Aïr, 23.ix.1922, in a cleft on a large rock. There was an outer framework of some twigs, and the nest consists of stems of grasses and other small plants, lined with finer material. The eggs are dirty whitish, spotted all over with rufous-brown and some mauve patches. They measure 18.5×14.2 , 17.8×14.2 , 17.5×14.5 , 17.6×14.2 mm.

Another nest, Tararet River, Aïr, 13.ix.1922. It consists of stems of grasses and other small plants and is lined with smaller material, fibres, and down of some seeds. It contained two eggs of a very different type from the other clutch; their ground colour is bluish white and they are spotted with brown and mauve. They measure 18.7×15.2 and 21×15.6 mm., the latter probably quite unusually large.

148. *Emberiza septemstriata goslingi* (Alex.).

Fringillaria goslingi Alexander, *Bull. B.O. Club*, xvi. p. 124 (1906—Welle River). Cf. *Nov. Zool.* 1921, p. 133, No. 137.

♀, Kusada, N.W. of Kano, between Kano and Katsena, 30.iv.1922.

♀♀, Gangara, S. Damergu, N. of Katsena, 30.vi.1922.

All three specimens in moult. These and the Zinder ones, obtained in 1920, belong to the paler form *goslingi*, but specimens in fresh plumage are darker than others in worn garb. Also observed at Gamram.

Hausa name, "Kafa." Tuareg name (Aouderas), "Tará," or "Tarayit."

149. *Passer simplex saharæ* Erl.

♂ jun., in moult, Taberghi, N. of Tanut, 4.vii.1922.

♂ ad., Tch-Bunker River, west of Aïr, 1.ii.1923.

♀ ad., Agouten, N. of Aïr, 2.iii.1923.

♂, Belkusi, S. of In-Azaoua, N. of Aïr, 6.iii.1923.

The specimen from Taberghi has the "upper mandible greyish, base and lower mandible pale grey," the males from Tch-Bunker and Belkusi have entirely deep black bills, but the latter has the upperside isabelline, not grey, the feathers being greyish (not grey) towards the base.

The Desert Sparrow was seen plentiful as soon as the true desert was entered, also west and north of Aïr. Also observed at Addanuk, Ahaggar, 26.iv.1923.

150. *Passer luteus* (Licht.).

♂♂, Farak, Damergu, 17.vi.1922.

♂♂, Fachi oasis (or Agram) between Bilma and Agades, 15.xi.1922.

One of the Farak specimens is in fresh, the other in worn and faded plumage. One of the Fachi ones is moulting wings and tail, the head is more greenish, back deeper chestnut—the paler specimens are probably younger. The species was also observed at Tanut. At Fachi it was not rare in the date-palms and said to be resident by the natives; none were, however, seen at Bilma.

151. *Gymnoris pyrgita pallida* Neum.

♂♀, Gurari, Tessawa district, west of Zinder, 29.v.1922.

♂, Farak, Damergu, 19.vi.1922.

In the acacia bush country. Hausa name, "Jambaka."

152. *Erythrospiza githaginea zedlitzi* Neum.

2 ♂, Assode valley, Aïr, 20.i.1923.

3 ♂, 1 ♀, Zilalet River, Aïr, 23.i.1923.

3 ♂ juv., 2 ♀, Obga, West Aïr, 27.i.1923.

1 ♀, Belkusi, north of Aïr, south of In-Azaoua, 6.iii.1923.

1 ♀ ad., Ten-a-curt, near Tamanrasset, Ahaggar, 23.iii.1923.

Observed in desolate "Black Desert" and seen feeding on berries of "Abisgee" bushes. At Belkusi considerable numbers came to the water, also at Tamanrasset coming to the water. (The "Trumpeter Bullfinch," unlike several other desert birds which do not require water, is fond of visiting water, and I have, in Algeria, generally observed it not very far from water, or at least temporary watercourses, though I am not sure that it is essential for these birds to go to water.)

153. *Sporopipes frontalis pallidior* Hart.

Nov. Zool., 1921, p. 136.

3 ♂, 1 ♀, Farak, Damergu, 15, 17.vi.1922.

♂♀, Aouderas, Aïr, 28.ix.1922.

♀, Tch-misgidda Nalburdaddi, Aïr, 4.x.1922.

The Farak specimens are in moult, but most of their body plumage is fresh. Though freshly moulted individuals are darker than those in old faded garb, the new series fully confirms the differences of this subspecies, which formerly Buchanan only found in Zinder and Damergu, and now also in Aïr proper. He also observed the species at Dan Kaba in northern Nigeria.

154. *Ploceus cucullatus cucullatus* (P. L. S. Müll.).

♂ ad., Tessawa, N.E. of Katsena (Zinder Territory), 24.v.1922.

"Iris full reddish madder. Bill shining black. Feet pale skin-brown."

The lesser and larger upper wing-coverts have pale buff tips, otherwise the specimen agrees perfectly with adult males from N. Nigeria and Senegambia.

Tuarag name, "Tagishit Akowat (In) Telgulumus," referring to the black mask which is supposed to resemble the veil of the Tuareg men.

155. *Ploceus vitellinus vitellinus* (Licht.).

♀ ad., Tarare River, Aïr, 7.ix.1922, to identify eggs.

The nest with four eggs taken, 7.ix.1922, is the usual Weaver's nest, large, with lateral entrance-hole, built of hard grass. The eggs are pale blue, without gloss, spotted with deep rufous-brown and mauve deeper-lying patches, measuring 20×14 , 21×14 , 20×13.5 , 21×14 mm.

Another nest of a Weaver was found suspended from an acacia twig at Tanut in South Aïr, 15.viii.1922, but was not identified! It contained two white eggs with rufous and deeper-lying somewhat mauve spots. No other weaver-bird is known in Aïr to which these eggs could belong. The nest is much

smaller, the eggs only 19×13 and 19×13.5 mm. I don't see why the nest should not vary somewhat in size, and similar variations in eggs are, of course, usual in eggs of other species of *Ploceus*.

Tuareg name at Aouderas, "Tagishit Akowat."

156. *Ploceus luteolus luteolus* (Licht.).

♂ ad. (rather pale in colour), Tessawa, N. of Katsena, Zinder Territory, 24.v.1922.

A nest in an acacia tree was found at Aouderas, Air, 30.ix.1922. Unlike those of the larger species of *Ploceus* the nest is composed of a kind of curly fine wire-like brown root-fibres and has an entrance-tube about 9 cm. long. The two eggs white, almost without gloss, and measure 18×12.5 and 17.5×12.4 mm.

157. *Aidemosyne cantans cantans* (Gm.).

An adult specimen was taken at the oasis of Bilma, 9.xi.1922.

"Iris dark. Eye-skin pale cobalt blue. Bill clear lead-grey. Feet pale purplish grey."

"This and the Black Wheatear are the only birds seen commonly about the dwellings at Bilma. A few observed at Belkusi, en route to In-Azaoua, 7.iii.1923."

158. *Estrilda senegala brunneiceps* (Sharpe).

This bird was found to be common in North Nigeria and everywhere north to Asben (Air). A nest was found in the interior of a Tuareg grass hut at Aouderas, Air, 28.viii.1922. It is built of fibre, leaves and pieces of cotton cloth, lined chiefly with guinea-fowl feathers, some white feathers, bits of string, and a few leaves. It contained two eggs, which are white without gloss, and measure 13×12 and 13.5×11.5 mm.

159. *Steganura aucupum aucupum* Neum.

Steganura paradisaea aucupum Neumann, *Bull. Brit. Orn. Club*, xxi. p. 43 (1908—"Upper Guinea, especially Senegambia." Type Diourbel, 140 km. east of Dakar).

Steganura paradisaea verreauxi (nec Cassin 1850 !) Hartert, *Nov. Zool.*, 1921, p. 138 (Zinder).

Three ♂ in moult from "off" plumage, Farak, Damergu, 18.vi.1922.

James P. Chapin, *Amer. Mus. Nov.*, No. 43 (1922), has pointed out the really important differences between *S. paradisaea* from East and South Africa, and *S. aucupum*, at the same time describing three new subspecies of the latter, and pointing out that *S. paradisaea* (as the name must be spelt) and *aucupum* occur together in vast areas, so that they must be treated as two species, and not as subspecies of one species. The colour of the band on the hind-neck appears to be of very little importance. It is regrettable that differences between females and non-breeding males have not been found, but among other animals (fleas, insects) such cases are by no means rare! At Farak always seen near the well. Hausa name at Kano, "Waaki-Waaki."

160. *Spreo pulcher pulcher* (P. L. S. Müll.).

A nest in an acacia tree found near Tanut in S. Air, 14.viii.1922. The nest was built of dry grass and contained two eggs. The eggs are greenish blue like

those of a Song Thrush, but without any gloss, with red-brown spots and a few deeper-lying greyish ones. They measure 26.5×18.8 and 27×18.5 mm.

Tuareg name, "Azagag," plural "Azagagam."

"Often seen in scrub, where it often feeds on the ground in open places. The species was also observed in northern Nigeria.

(No. 162, p. 139, *Nov. Zool.*, 1921, I called *Lamprocolius chalybaeus hartlaubi*, but this is not correct! The species was described as *Lamprotornis chalybaeus* Hempr. & Ehrb., *Symb. Phys.*, fol. y, pl. x. (1828—Dongola!), and ranges from Dongola through the Sudan to Air and Senegambia, while the Abyssinian *cyani-ventris* is a much larger bird. The bird will therefore have to be called *L. chalybaeus chalybaeus*. Though it was Sclater & Praed's opinion, and I have—*Nov. Zool.*, 1919, p. 134—endorsed it, that *L. chloropterus schraderi* Neum. is a synonym of *chalybaeus*, this is certainly not the case! *L. schraderi* is apparently a different species even, being smaller and having some colour differences.)

161. *Cinnyricinclus leucogaster leucogaster* (Gm.).

Turdus leucogaster Gmelin, *Syst. Nat.*, 1, ii. p. 819 (1789—"Habitat in regno Africae Whidah," Slave Coast, W. Africa).

♂, Dan Kaba, N. Hausaland, 16.v.1922.

"Iris clear yellow. Bill and feet deep black."

The occurrence in the same countries of both *C. l. leucogaster* and *verreauxi* is still to be explained. This was the only specimen seen by Mr. Buchanan. The Hausa name, "Macheni," was given him at Dan Kaba.

162. *Oriolus oriolus*.

Observed at Ideles, Ahaggar.

163. *Corvus albus* P. L. S. Müll.

♂ ad., Aouderas, Air, 30.x.1922.

"Iris dark. Bill and feet very deep black."

The Targi call this crow "Aralgi" (the male), or "Taralgi" the female.

"It does much damage to dates at Aouderas and molests camels with sores, sitting on their backs and pecking at the wounds. The crows are eaten by some of the natives and I saw some taken home with their throats cut in proper Mohammedan fashion, so that they could be eaten" (Buchanan).

A nest with five eggs was found near Marandet in Air, 8.viii.1922, in a low "Giga" thorn tree. The eggs are rather blue and sparsely spotted, but typical Crows' eggs. They measure: 43×30.4 , 43.1×30 , 42.5×30 , 42.1×30 , 42.6×30 mm.

164. *Corvus corax ruficollis* Less.

♂, Bilma oasis, 10.xi.1922. Partially moulting. The fresh feathers raven-black, some old ones brown!

"Several were seen at Bilma, where they are said to be resident; no other Ravens seen at Bilma. At Iferouane I was asked by a Chaggar native to shoot

him one for medicine, the bile or spleen of the bird being rubbed below the eyes in Aïr " (Buchanan). Also observed at Ten-a-curt, near Tamanrasset, and elsewhere in Ahaggar.

165. *Corvus rhipidurus* Hart.

♀, Tabbello, Aïr, 21.x.1922.

"These birds were frequently observed and always in pairs, and even in the most solitary places when one is out shooting. At Iferouane I was asked by a Tuareg from Ahaggar to shoot one for him for medicine for the eye. When I had shot the bird he split it open from the breast and took out its liver; from the liver he extracted a long black thing, which was his coveted "medicine."

AN ORNITHOLOGICAL VISIT TO N.W. MAROCCO (SPANISH PROVINCE OF YEBALA)

By REAR-ADMIRAL LYNES.

Plates I (Map)¹ to V.

PART I. FOREWORD.

THREE years ago, writing on the Ornithology of the Middle Atlas in *Ibis*, January 1920, I hazarded the opinion that as affairs then stood, there seemed little prospect of any naturalist being able to explore Spanish Morocco on account of the hostility of the greater part of its native population towards the Protectorate.

Señor Angelo Cabrera, the well-known mammalogist of the Madrid Natural History Museum, pointed out, however (in *Boletín de la Real Sociedad Española de Historia Natural*, tomo xxii. 1922), that this surmise was scarcely correct, since for some seven years past he and other Spanish naturalists had actually been able to work, under Spanish protection as well as with native help and goodwill, not, it is true, the high mountain-chain of the interior commonly known as "the Rif,"² but considerable areas both in the east and west of the Spanish zone, and I may add that to see to-day the fine collections, particularly of Mammals and Insects, in the Madrid Museum, is to observe that these gentlemen made good use of their opportunities.

In birds, however, scarcely anything save in the Tangier-Tetuan neighbourhood and Atlantic seaboard has been done during the last fifty years, and the unsatisfactory state of some of the records is well shown in Hartert and Jourdain's "Hitherto known Birds of Morocco" (*Nov. Zool.*, xxx.)³ so that in 1923 Spanish Morocco still presented a fruitful field for ornithological exploration.

When, therefore, I received last January, with approval of the high Authorities concerned, an invitation from Señor Cabrera to accompany him to Spanish Morocco during the forthcoming spring, and "see for myself," it naturally gave me great pleasure to accept so agreeable a proposal; the more so, since the recent conquests of Spain, and submission of the famous "Raisuli"⁴ now made accessible to natural-history enterprise some of the highest and best-timbered mountains lying in and on the borders of Yebala Province.

It is the ornithological results of this expedition which it is purposed to record in the following pages.

¹ The second (loose) map is supplied to enable readers to compare it with the text without turning to the back.

² See remarks in Part III on this name.

³ This up-to-date ornithological record for Morocco has proved invaluable to me, both out there and in the writing-up of our trip. It will be so constantly referred to, that the reader of this paper is recommended to have it alongside him if possible.

⁴ Or "Raisuni"; his full style is given as "Cherif Mulay Achmed er Raisuni," or "Si Ahmed ben Mohammed el Raisuli."

Our travels in Yebala took us, here by automobile along military roads, there by bridle-path, into mountains, towns, and holy places of Islam, up to less than three years ago jealously screened from foreign gaze, without a suspicion of trouble or unfriendliness on the part of the native inhabitants, and although it would doubtless be untrue to say that this happy state of affairs was not in a great measure due to the efficiency of our police escorts, there really were times and places where the harmonious atmosphere, Spanish Moroccan, seemed to render a guard almost superfluous.

That Spain was able about a year ago to replace a military by a political administration in her Moroccan Protectorate, and that so far as Yebala is concerned the resulting advance of civilisation has been very satisfactory, is in itself a high tribute to the stability of her method of progress there, and to the admirable work of the police force under General Castro Girona, aided by such officers as Major Fuentes, Captains Portillo, Castello, and others with whom we have been so pleasantly associated: a combination of the *suaviter in modo* with the *fortiter in re* which, as experience with the Arab peoples under our own British rule has shown, best gains their confidence, rather than a policy in which coercion is the dominant factor.

So far as the Rif Province¹ is concerned, as we all know, things Spanish have not prospered; the Melilla disaster of 1922 upset much of the progress made in that province, and is the real cause of the trouble in Spain about her "Moroccan affairs" of which we have read so much in the newspapers lately. Still, that is no reason why Yebala should suffer; there seems to be no suggestion of alliance between the Yebala tribes and the dissident Rifi, except just in their adjacent territories, where some of the former are still inclined to mingle common cause with the latter.

Here, strong Spanish and Moorish guards are maintained, and the local resources are quite able to compete with any such raids or invasion as may be reasonably anticipated.

I am glad to hear from my Spanish friends in Yebala that the recent political *volte-face* in the mother-country has so far (October 1923) not upset the smooth working of the governmental machinery in Yebala, and hope that so affairs will continue, as well as inaugurating a new era of success in the East.

It would surely be lamentable if Europe still has to admit failure with these troublesome neighbours, even though "the Rif pirates" no longer menace her sea-traffic. Alike with some (physically) similar parts of the French Moroccan Protectorate, these large tracts of wild mountains dominating fertile valleys remain to-day, as throughout the ages of history, closed to civilising influence, their mountain Berber tribes maintain the independence they never seem to have lost throughout the successive North African invasions of Phœnician, Roman, Vandal, Goth, and Arab, or at least only relinquished by voluntary intermarriage in the lower parts of their territory.

In bygone days a large Cherifian army was wont at long intervals, we read, to compel some measure of obedience or obtain retribution from a particularly troublesome tribe, for just so long only as the conquerors remained in sufficient force in the neighbourhood. A few weeks—perhaps less! Arab-like, these tribes appear to be constantly on the look out to plunder one another, and while they

¹ See definition in Part III.

undoubtedly have recurrent phases of combination¹ against European (or external) invasion it seems highly improbable that any permanent condition of hegemony is, or ever has been, in existence among them.

What is to be the future of this territory? One has but to view from air or mountain-top the nature of the "country" to realise the difficulty of even temporary military occupation. When will the philosophy of its tribes view stability of government, and intercourse, social and mercantile, with external peoples, as beneficial to their present and future existence?

Whatever may be the modern solution of the problem, it must at least be conceded that in the taming of these folk Spain has no mean feat to achieve!

But it is not my intention, nor indeed do I dare to speculate in political events of the future; thus far only have I ventured, in order to make the kowtow for my former misstatement, to record my just tribute of respect and admiration for the strides of progress it was my privilege to observe in Spanish Morocco, and to wish continued success to the administration in whatever form the mother-country finds best suited to her own resources and the advance of civilisation.

Here, also, I wish to acknowledge most gratefully the ægis and assistance accorded to us by Señor Aguirre, Minister of the Morocco Department, and by Dr. Bolivar, Director of the Natural History Museum at Madrid; also the cordial co-operation of H.E. Señor Silvela, High Commissioner for Morocco during our visit, and of the Spanish authorities wherever we went, which made the expedition so pleasant, and we hope profitable in its small degree, to natural science.

Finally, I should like to record my appreciation of Señor Quiros' good work in the preparation of our 270 bird-specimens; and last, but not least, to offer the warmest of thanks to my friend and cicerone, Señor Cabrera, for his companionship, and for the kind trouble he always took, sometimes, I fear, to the detriment of his own researches, to arrange everything so well and suitably to the pursuits of "the British Admiral."

I also wish to acknowledge the kind help given me by Dr. Hartert and Lord Rothschild, whose acceptance of the bird specimens for inclusion with the fine North-African collection at Tring assures their bestowal to the greatest possible advantage.

PART II.—ITINERARY.

- | | |
|---------------------------|---|
| March 13, 14 . . . | Ceuta (sea-level), Tetuan (300 ft.). |
| March 15 to 21 . . . | Quitsan (600 ft.) four miles south of Tetuan, on lower slopes of Beni-Hozmar Mountains (max. 3,600 ft.). |
| March 22, 23 . . . | Tetuan. |
| March 24 to April 4 . . . | Xauen ² (2,000 ft.), in El Ajmas tribal territory and on the lower slopes of Jebel Mago (7,200 ft.). |
| April 5 to 16 . . . | Tetuan (held up by bad weather). |

¹ Read the valuable account of a quite recent adventurous "Visit to Abdul Krim, the despot of the Rif" by a correspondent in *The Times* of September 15, 1923. But the idea of the "Rifi's" descent from the Vandals is surely not in general acceptance? On p. 95 of my paper will be found some reasons for not including in the terms "Rifi" (or "Riffian") any of the Yebala tribes, with which I think *The Times* correspondent will agree—if he ever sees them!

² "Xauen" = "Chechauen" of our maps, ex Chef-Chauen or Xef-Xauen—the prefix being merely a corruption of the Berber article "esh," which, as with the Arabic "el" preceding the names of most important towns, is, as often as not, dropped, both in conversation and writing.

- April 17 to May 8 . Tazarut (2,200 ft.) and the "col" or pass of Arosa Mensoja (4,000 ft.) by Jebel Buhasem in Beni-Aros, tribe of Raisuli.
- May 9, 10 . . Tetuan.
- May 11 to 16 . . Ceuta, working Sierra Bullones, and the sea-coast of Straits of Gibraltar, including the Isla de Perejil.

Leaving London on March 6, 1923, I joined Señor Cabrera at Madrid the following evening. Next day my companion took me to the fine new Natural Science Museum, where I had the pleasure of making the acquaintance of Dr. Bolívar, its distinguished director, Señor Gil, who is working at the birds there, and other scientists.

In the hall devoted to mounted examples of mammals and birds are a number of beautiful groups by Señor Jose M^a Benedito; Buzzards, Bee-eaters, Magpies, Eagles, Owls, and others, with nests and nurseries; works of artistic skill, as true to Nature as I have seen anywhere.

In the Entomological Section Dr. Bolívar showed me a magnificent array of specimens, already filling box after box in the Spanish Morocco cabinets. This day I also had the honour of being presented to Señor Aguirre, to Señor Ortega, head of the valuable Spanish "African League," and to other gentlemen influential in Moroccan affairs.

March 11 and 12 we spent at Gibraltar, where Rear-Admiral and Mrs. Ellerton not only most kindly entertained us at the "Mount," but saw us, bag and baggage, safely and luxuriously through all those usually tiresome, train-customs-steamer transshipments, into the mail-boat for Ceuta early on the 13th. A fresh Levanter was blowing, and we had a rough crossing.

We scanned many of the larger Gulls, both at sea and round the Ceuta fore-shore, but without being able to arrive at any definite conclusions, specific or racial, with regard to them; the majority were certainly Pale-backed herring-gulls (*argentatus*) with yellow legs, then there were a few with mantles that seemed to us as dark as "*fuscus fuscus*," others intermediate in colour, and whenever we got a glimpse of the legs, all seemed to be yellow or yellowish, which may or may not have been an optical illusion. Size varied considerably. We could do no more then, than to plan a visit to the seacoast gulleries on our return in order to decide what species were breeders. This we eventually did, see pp. 36, 86.

The two-hour train journey from Ceuta to Tetuan takes one along the seashore as far as Cape Negro, across what is more or less a plain, or succession of flats which receive the eastern spurs descending from the hill-spine connecting Apes Hill and Jebel Dersa above Tetuan, where the wide "Vega" of Tetuan, the bed of the Rio Martín, separates the latter from the southern ranges of Beni-Hozmar, Beni-Hassan, etc.

This Ceuta to Cape Negro flat country is clad with palmetto scrub,¹ asphodel lentisk,² cistus, and other low bushes; swampy spots and small shallow lagoons of fresh water are numerous at this season. On the lagoons were still a few ducks, on the dry ground Stonechats abounded, Meadow pipits rose in scared parties as the train rolled by—had it not been for a few Buff-backed herons, two Black kites, and a few Swallows (which, by the way, with House-Martins were at

¹ *Chamaerops*.

² *Pistachio lentiscus*.

Madrid on March 9), one might have supposed it to be midwinter from the wet state of the land and condition of its animal and plant life.

As can be seen from the train, all this N. and S. hill-spine is just a monotonous descent of comparatively low spurs and rolling-hill country, clothed with the usual West Mediterranean scrub, the Andalusian "monte,"¹ no trees save an occasional "holy" acebuche (wild olive), their heights are not even crag-crowned. Whatever of bird interest is to be found in this district, almost certainly will be found in the flat country traversed by the railway, which in bygone days was well known to the Royal Navy and Gibraltar Garrison as a good wild-fowling place in winter. If anything special may be mentioned, it will be little more than Munn and others allude to; the Ospreys, Gulls, Rock-pigeons, etc., breeding on Cape Negro. *Turnix sylvaticus* must nest among the palmetto scrub; I have flushed them there in summer time; perhaps the Lesser bustard summers, it is likely ground . . . but little of novelty to the Moroccan list is likely to come out of the district.

This part of the railway passes by a number of Spanish military pickets, posts, and training camps, as well as by long-established fishing hamlets, whence the Ceuta markets get an abundant supply of Mediterranean fish and edible (ahem!) crustaceans.

The Vega of Tetuan, little above sea-level, is just a wide flat to the southward of and below Tetuan, largely cultivated and therefore dull in the bird line; through it the Rio Martin pursues its winding course and is now no longer navigable for anything but small boats; whatever it may have been in olden days, for some twelve miles up (only eight as the crow flies) lies ancient Tamuda, mentioned by Pliny as a seaport. Excavation of these ruins, now in progress, show, we were told, superposition of Roman on Carthaginian and again on still more ancient buildings of great antiquity (but no architectural worth), and have resulted in many interesting archæological finds, including coins of various ages, some perhaps as old as 4000 B.C.!

Tamuda itself stands on the end of a spur from the Beni-Hozmar range; to the westward the Vega continues a little farther, until it loses identity in the spurs that encircle the many affluents of the Rio Martin. Overlooking the Vega lies the capital of Spanish Morocco, the ancient town of Tetuan—picturesque, white, flat-topped, domed, mosqued, and minaretted as ever, with the new Spanish quarter added on to the westward, in as good style as possible to avoid architectural lack of harmony with the Moorish: this part, of course, contains the Government buildings, European shops, theatres, hotels, plazas, etc. The Khalifa lives in the Moorish Town.

Tetuan no longer lies outside the civilised world, as it did up to a few years ago.

At Tetuan we lodged luxuriously at the "Alfonso XIII Hotel," and paid our respect to the Authorities. I had the additional pleasure of making the acquaintance of Major Don Anatolio Fuentes, Chief Staff Officer to General Castro Girona of the "Policia Indigena," Captain Portillo, and other gentlemen.

¹ "Monte" as Andalusian "brushwood": mainly composed of a 2 to 5 ft. high growth of *Cistus*, *Genistae*, Heath, Lentisk, Wild Olive, and other low bushes, according to soil and locality; more or less analogous to "maquis," is a good descriptive term which, except in strict botanical detail, equally well suits the growth on the treeless scrub-clad hillside expanses of Yebala in general, and will, hereafter, be frequently used.

Acting on Señor Cabrera's previous experience of Yebala, we had decided, if possible, not to camp out, but to get a roof over our heads in some suitable bird-place, until after the heavy winter rains were over, which normally would be early in April.

Our friends of the police force, having learned our wishes, at once most kindly made all arrangements for us to go and stay in a Police Barrack at Quitsan, some four miles south of Tetuan. We could see our prospective quarters from Tetuan—a courtyarded house in the Spanish style—white walls and orange-tiled roof—standing near a conspicuous little white mosque, on the lower end of a spur of the Beni-Hozmar Mountains, whose grey-purple crags rose in towering masses beyond, seemingly over it. Accordingly, the following day (March 15) we rode across the Vega and by midday were comfortably installed in our appointed quarters.

Here we stayed six days, much hampered in our work by the bad weather, which set in just as we got to Quitsan, and lasted nearly the whole of our time there.

A little below us stretched the small Moorish village—with the mosque crowning it and the stream washing its foot. Orchards (the Quitsan oranges are celebrated) and agriculture occupy nearly all the lowest ground from here right into the Vega. Our house was just on the fringe of and above nearly all this cultivation. Except for a few little hamlets with their accompanying clearings, all at our back, so to speak, was first, "monte"—clad slopes, then mountain.

For the first few days we worked the lower ground, but found bird-life there rather dull. The orchards held a few Bulbuls, besides the common finches, black-birds, chiffchaffs, etc.; among the thick bramble and cane brakes bordering the streams Cetti's warbler was frequently heard, and one Tschagra seen. In the great wastes of monte one could walk, and struggle (for it is often over one's head in moist dips), for hours, without finding more than a few Sardinian warblers, perhaps a Dartford, and a Blackbird "clucking" in a jungle of "acebuche" and lentisk, or on a cleared patch flush a Wood or Crested lark and a few Meadow pipits. . . .

In fact, with the exception of certain tracts of scrub "Arar,"¹ which did not appear to affect the ornithological aspect, these slopes seemed identical in vegetation and (lack of) bird-life with those similar, dreary but aromatic, stretches of low-hill country on the Spanish side of the Straits.

The only trees for miles around, save those of cultivation, are small groves of "acebuche" and "Arar," sheltering burial or "holy" places, and the Mosque. In one such, near our house, were generally to be found a few Great and Blue Tits, Finches, Blackbirds, etc., but the only bird of note there was a Wood-owl, who was wont to call occasionally in the day-time until we discovered his perch on an upper bough and made a specimen of him.

Having found so little in the lower zone, we turned with hope to the upper streams and crags of Beni-Hozmar above us to the southward and westward. Here, some two miles upstream of Quitsan, villages and cultivation cease at a 25 ft. cascade, and one enters the mountain-zone in a steep-sided rocky gully, in which the stream has the character of a torrent, with occasional cascades. Limestone cliffs and buttresses crown the horizon upwards, below them, where soil rests among piles of rocks and clitters of stones, the "screes," are thickly

¹ *Tetraclinis quadrivalvis* (Vent.) = Sandarac tree—a conifer confined to N.W. Africa.

clothed with Box¹ and "Arar" scrub, Lentisk bushes, etc.; here, again, except in detail, the whole entourage is a replica of what one finds so much of in the Campo de Gibraltar.² But, whereas *there* one would be pretty sure at this season of finding Vultures at home in the crags, and likely enough see an Eagle or Lämmergeier soaring overhead, *here* we sought in vain for *any* large bird; a single Red kite and a passing Sparrow-hawk were the only birds of prey we ever saw; pairs of Barbary partridges frequently rose noisily from the scrub, an occasional Rock Bunting or African Chaffinch, Crag and House Martins, both species probably on passage, a few Wrens and one pair of Dippers about complete the bird-census of that wild gully.

Continuous bad weather prevented us getting our projected day among the crags, but their promise of ornithological interest, judging from spy-glass inspection from half-way up, seemed small; later in the year Choughs and Ravens would doubtless be up there, nesting, but now, except in the case of the Dippers, and for early flirtations of Blue tits and Crested larks lower down, there was no suggestion of breeding.

Generally speaking, Quitsan, while of course providing its interest from the distributional point of view, and as being, presumably, near the place whence came M. Henri Vaucher's record of Alpine accentor, Ring-ousel, etc., proved dull and rather lifeless. Migration was in marked progress in the case of Chiffchaffs, Blackcaps, Swallows, House and probably also Crag martins, and Meadow pipits; while some of the Finches by their restless movements appeared also to be on the move northwards.

Diurnal movements of Choughs, Jackdaws, and Woodpigeons, at considerable height and range, were frequently observed.

Save for the migratory movements and the few exceptions just mentioned, conditions of life in Beni-Hozmar gave the impression of being still those of winter.

On the day of equinox the weather cleared, enabling us to dry our things and (on the 24th) proceed by motor-car to Xauen, forty miles south of Tetuan.

TETUAN TO XAUEN.

For the first twenty miles of this journey, with the exception of, first, the crag-crowned mountains of Beni-Hozmar, and then the similar and virtually connected Beni-Hassan range to our eastward, the whole landscape, right away to its comparatively low hill horizons, is curiously like much of our own Northern country in early spring; hills and dales, moorland tops and slopes varied with chequered arables; here, green squares of young autumn-sown wheat, there, red-brown ploughs ready for later crops, pastures in the wider dales, and so on, no striking feature anywhere, practically no trees. . . .

Only, one must not look too closely into detail, for then the pseudo-moorland gorses, hedgerows, willows, etc., turn into four-foot high wastes of "monte" with cancellations of the same between cleared areas; the grazing, more asphodel

¹ *Buxus balearica*.

² The name of a Spanish military zone (to be found on most maps), part of the Provincia de Cadiz, lying about thirty miles W. to N.N.W. of Gibraltar, which embraces most of Irby's Spanish hunting-ground, the cork-woods of Algeciras, Almoraima, Laguna de Janda, and the numerous small sierras as far north as the "Pico del Algibe."

and palmetto than grass and so forth . . . a country, so far as mankind is concerned, peaceful, smiling, and prosperous, but dull and poor in wild life.

We passed military pickets and posts at frequent intervals along the whole route, others at commanding positions were ever in view on the skyline, and about half-way to Xauen the road crosses the water-parting Rio Martin / Wad Lau at the considerable camp of Zoco Arba, 2,300 ft. Hereabouts were flocks of Yellow-billed choughs and Ravens, the former rook-like, picking over the ploughs, the latter scavenging the camp itself, House sparrows and Swallows as usual. . . .

The descent from Zoco Arba into the Wad Lau valley introduces a little more character into the western landscape in the shape of a few cork-trees, a wider river-bed grown with arbutus and bramble jungles, occasional willow- and ash-trees, olives, and more pasture; while as the J. Alam-Buhasem-Sugna chain (summits 5,500-4,500 ft.) opens out, one can see there, broken crests and evidence of deciduous as well as of evergreen tree growth; but nothing big or extensive. The wealth of forest we later found on J. Buhasem, etc., lies almost entirely on the reverse, i.e. the Beni-Aros face of the chain.

Bird-life continued scanty, but on crossing the Wad Lau (at 1,100 ft.) below Xauen, it was cheering to see a pair of Grey shrikes on the telegraph wires and our first *hispanica* Wheatear. Three miles farther, winding for its greater part up a shale slope, the road reaches the cliffs of J. Kalaa, immediately under which, on ground falling rather steeply to the westward, lies the picturesque old Moorish town of Xauen.¹

Here we spent the next ten days, sleeping in a very clean little inn, and taking our meals, semi "alfresco," at a restaurant, both establishments Spanish.

J. Kalaa is merely the conspicuous terminal peak of the N.W. spur from J. Mago, a well-defined mountain mass whose crown of conifers and twin summits, the Peñas, 7,200 ft., at once inform the traveller from the northward that he has come to something big and new. Mago is, in fact, the western terminal of the high Rif chain²; it is composed of compact limestone of the Mesozoic epoch³ resting on more ancient formations, which appear, mainly in shales, from its base up to about 2,000 ft.

Precipitous cliffs on this (western) face are almost confined to the 2,000-3,500 ft. zone just above the town level. The town itself is dominated on its N.E. side by J. Kalaa, and to the eastward by the terminal cliffs of another spur, falling due west from the North Peña of Mago; down between these two spurs tears the torrent of the O. "Raas el Maa" which provides the town with its copious and perennial water supply. To the southward this western spur combines with the Peñas and main south-western slope of Mago itself, to enclose a great steep-sided basin open only to the westward, which will hereafter be referred to as "the amphitheatre."

Around the town, and on either side of the Raas el Maa, down to its junction with the O. Lau, three miles away and 1,000 ft. lower down, lie terraced orchards

¹ See Plate II, a.

² See Part III.

³ I am indebted to Mr. W. Campbell Smith of the British Museum for the identification of our geological specimens from J. Mago and of others from J. Buhasem. In general, they confirm the anticipations of M. Louis Gentil in his excellent "Carte géologique provisoire du Maroc . . . 1920," but as we were unable to find any fossils, our specimens cannot decide what is the period of Mago's limestone, although, as the distinguished French geologist surmises, it is probably Jurassic, as other parts of the chain are known to be.

of olives, figs, and other fruit-trees, associated with vines and crops of fodder, barley, beans, etc.

The remaining ground below town level is just a series of featureless shale slopes, clad with low " monte " here and there cleared for agriculture, distinctly dried up and monotonous.

A few days work around and below Xauen sufficed to show that the scarcity of birds here was even more marked than at Quitsan. The orchards held a few Bulbuls. Great and Blue tits, Blackbirds, etc., the " monte " slopes, nothing but a sprinkling of (*theklae*) Crested larks and Sardinian warblers, a few Dartford warblers, Cirl Buntings; in the O. Lau valley, a few common Finches, the usual Great and Blue tits, Chiffchaffs, the same old pair of Grey shrikes, and so on—everything very scarce, one could ramble about there for half-an-hour or more without sight or sound of bird-life, save perhaps of a Raven in the distance.

The cascading " Raas-el-Maa " was more cheerful; for instance, a pair of Dippers, Grey Wagtails, numbers of Kitty Wrens and Blackcaps, a few Cetti's Warblers and so on, and of these, despite the difficulties, first of shooting in what was virtually the town laundry, and secondly of retrieving the result from out of the dense brakes or swirling torrent, we got specimens.

Ravens about the camp, House Sparrows, Swallows, and one pair of Storks appeared to be the only town-dwellers—perhaps later, Swifts could have been added, but I think *not* Rollers.

In the upper zone of J. Mago, we hoped for altogether better things; from Xauen we could see its towering skyline serrated with conifers, and so lost no time in making their closer acquaintance. We might not go higher or further than the upper blockhouse, which at 6,500 ft. is the last (high) outpost before coming to Rif territory. Nevertheless, a goodly expanse of forest in " the amphitheatre " was accessible to us, and we made altogether three visits to it; capital exercise, since it meant about 4,000 ft. of very steep stony track up, before one could get into the forest and begin work; then, since we might not be out in the dark, there was the much less pleasant descent to Xauen before nightfall.

The following short account of one of these excursions from my diary of March 29 will perhaps describe the place as well as anything:

" Leaving Xauen at 7.40 a.m. with two Moorish policemen, we cross the Raas-el-Maa by the bridge of Bab-el-aonzar or ' Gate of the Fountain ' just outside the eastern gate of the town, and skirt the talus below the cliffs of Mago's western spur, steadily rising. A few Kestrels are crying high up the cliffs, which rise in tiers for several hundred feet above us. Crag martins are absent to-day; those we saw here four days ago (and never since) were therefore probably on passage.

" A pair of Rock Buntings and one Chaffinch are the only other birds seen before (at 2,700 ft.) we leave our pack-road and turn up the steep track by which we are to enter ' the amphitheatre ' and ultimately reach the forest. For the next 300 ft. we pass under and round many cliff-faces and rocks exhibiting complex ' dips ' and crumplings of ancient strata.

" Now we begin to leave the cliffs below us, and enter the great ' amphitheatre ' whose lower slopes are here lightly clad with cistus and lentisk ' monte,' then pass a little grassy patch with a spring of clear water; below us, the ' bar-ranca ' ¹ which drains the amphitheatre of snow and rain, but is now dry, is

¹ Glen.

traced out by the usual oleanders and brambles. No birds so far, all is silence.

"At about 3,600 ft., when well inside 'the amphitheatre,' the track, hitherto east-going, curves to the southward and we begin to ascend its north-facing slope. Oak scrub now begins to appear among the 'monte,' and large patches of it have been cleared by fire during the recent winter. Still no sign of birds, but at 4,000 ft. a pair of Dartford warblers appear, on the scrub tops. We shoot both; they would soon have been nesting. The ground now gets moister, and up to about 4,600 ft. supports a rather dense belt of oak, lentisk, juniper, arbutus, myrtle, and heath 4 to 7 ft. high, in which we hear the chuckle of a Blackbird and a robin-like song: a Moussier's chat and another pair of Dartfords show themselves for a few moments. *Cistus* has dropped out.

"In the small clearings among this bush-belt we begin to find a few of the upper-zone plants; this must be due to the northern aspect, for it proves to be only *above* the belt that the vegetal character of the upper zone really begins to establish itself.

"This occurs at about 5,000 ft., where we find ourselves at a grove of scattered 'encinas'¹ (now only just in tiny bud), on the main S.W. slope of Mago and the mid-rim of our 'amphitheatre.' Here at a grassy patch adorned with peonies and several kinds of bright upper-zone lilies, watered by an overflowing spring, our 'short-cut' foot-track meets the path that climbs Mago by a longer but easier gradient from farther south, and which up to this point, but no farther, is possible for mules and donkeys.

"Here, too, something fresh occurs in the bird line: a pair of Jays. They scream, and make off by short flights until over the 'skyline' 700 feet above us, without giving chance of a shot;² a pair of Great tits are see-sawing in an oak-tree. The view is fine; from N.N.W. all the way round through west and south up to S.E., beyond which *Mago* hides everything. The J. Alam-Buhasem-Sugna chain certainly has a fair number of trees, though nothing like 'forest,' on *this* face, but nowhere else can we see a sign of tree-growth, even in the vista of equally high, if not in places higher, mountains between S. and S.E. The Moorish town and French camp of Ouzzan, thirty miles to the south-westward, gleams white in the lowlands, through a gap in the hills which are considerably less on that bearing. . . .

"Proceeding, we soon arrive at a point whence two tracks diverge, one very steep, leading straight up to the two blockhouses at 5,800 and 6,400 ft. respectively, the other, which we take, worming round on moderate up-grade into 'the amphitheatre' again. All this upper part of the mountain is composed of hard, jagged, white-grey limestone, much of it weathered bare, in fact just like many of the Sierras in the Campo de Gibraltar; bushes, low or creeping, of juniper and oak, wedge themselves into crevices wherever soil is sufficient for their growth.

"More Dartfords here; this time two cocks courting a hen. But now our chief interest lies in the fact that we are approaching the outlying conifers, and at 10.30, i.e. three hours from starting, on rounding a ridge which up to now has screened it from our view, we enter the forest at 5,350 ft. The conifers are

¹ *Quercus lusitanica* Lam., a deciduous oak (not "*Q. bellota*," which is only a variety of *Q. ilex*, M.A. p. 272 gives the wrong name).

² But we bagged one of them here on our next visit.

Pinsapos,¹ a fir species, hitherto believed to be confined to the upper north-facing slopes of three small limestone Sierras in S.W. Andalusia. Here, on this northern slope, they stretch down to as low as 4,500 ft., almost to the inner bottom of 'the amphitheatre'; and a few intermingled cedars² are so stunted as to be a negligible feature, but as we noted a few days previously, on the S. and S.W. slopes, the conifer cap (so far as could be seen from the upper blockhouse beyond which we might not go) descends only so low as about 5,500 ft., and contains many fine cedars mixed with the Pinsapos.

"There are thus these two differences in kind and altitude of the forest due to 'face.' The trees extend up to the summit, wherever they can wedge themselves in among the jagged rocks: as viewed from here, the skyline, including the Peñas or twin summits, looks about one-quarter serrate with Pinsapo silhouettes.³

"The average tree is not tall, only about 40 ft., but some of the old monarchs are imposing; one, about 70 ft. high, measured 14 ft. in girth at 4 ft. above the ground. The proportion of dead, whitened trunks still standing is large; these are mostly old trees, seemingly snapped off halfway up the trunk in natural process of decay.

"A little woodcutting is going on, and evidently has been long before the Spanish occupation, and in one place a number of trees had been damaged by fire, but the forest in general does not appear to have suffered appreciably at the hand of mankind.

"Evidence in support of the latter surmise is the striking difference in growth between these and the Pinsapos on San Cristobal in Andalusia. There, they have mostly grown up with unnatural candelabra'd trunks,⁴ weird and gnome-like as in a Grimm's fairy tale, almost certainly the result of early lopping for charcoal, a fact equally evident in their companion oaks, but here it is the exception to find but the single leader; we never saw more than three, and they all well mast-headed.⁵

"Inside the 'amphitheatre' much of the rock has been decomposed, but while the soil so laid supports, in its moister parts, an occasional encina (up to 30 ft.), a few stunted maples (4-6 ft.), hawthorns (6-9 ft.), with a sprinkling of wild gooseberry, buckthorn, and spurge laurel⁶ bushes, hollics, and a few other evergreen shrubs, there is but little real undergrowth. At this season the vegetable kingdom so high up is only beginning to show signs of awakening; nothing is beyond the early bud stage; peonies, which were in half-flower at the 5,000 ft. grove, have only just thrust their fat red-brown bodies out of the soil, and little else has yet appeared above-ground to show what the floral tapis might be like in summer.

"Although now snow-free, it is evident that winter's mantle has not long cleared.⁷

"As to birds, we have scarce entered the forest than our hopes are agreeably raised by seeing a Nuthatch fly by, calling, but a whole hour follows without other signs of life, save a few Chaffinches and a pair of Blackstarts seen in the offing.

¹ *Abies pinsapo* Boiss.

² *Cedrus atlantica* Manetti.

³ See Plates II and III.

⁴ See Abel Chapman and Walter Buck's *Unexplored Spain*, p. 350.

⁵ See Plate II, d.

⁶ *Rhamnus alaternus* L. and *Daphne laureola* L.

⁷ But more snow fell in April and was still lying there on May 5.

"At last a Nuthatch suddenly comes and calls from the top of one of the few encinas, where by good luck I am standing, and is secured, evidently 'atlas,' by its slender bill.

"For the next four hours, with eyes and ears on the alert, we scramble about under the trees, the total result, expressed in terms of animal life, being—two Treecreepers, both shot but only one retrieved, thanks to the awful clutter of boulders into which the other dropped, two pairs of Blue tits, two single Firecrests, one Great tit, and a small troop of Barbary apes making a hasty retreat uphill—*seen*; and one Nuthatch in the distance and a few tiny squeaks unlocated in the thick pinsapo foliage—*heard*.

"At this season, at any rate, it is desperately lifeless up here, and withal cold and gloomy when the drifting *niebla*¹ envelops us; we feel like to be petrified body and soul before another bird comes along, and so wend (if that verb can rightly be used for the homeward journey down that beastly slope), seeing as little in the way of bird-life as on the way up, until down to the same Kestrels in the cliffs, the Chaffinches in the orchards, the usual pair of Red-tailed buzzards high over, and the Sparrows and Swallows in Xauen."

On April 1 we spent another five hours in the pinsapo forest, saw neither Nuthatch nor Creeper, but added to our list one, possibly two, pairs of Coal-tits, four Stockdoves in it, some Choughs, and a *Falco* of sorts high in air over it. During the last two and a half hours of this (third) visit, no living creature was seen or heard; the gloom of the place was extreme.

The scarcity of birds in all this Xauen district was even eclipsed by that of small mammals; Cabrera's total catch, after much labour in various types of environment, was one house-mouse caught in our bedroom; he attributes this, if to nothing else, to the masses of brown rats which swarm throughout the town and camp like rabbits in a warren. As regards migration, except for Crag Martins and Chiffchaffs, probably also Swallows and Blackcaps, though in their case *some* of the individuals were summer visitors, courting and singing, there was little noticeable. On the whole the Xauen neighbourhood, except the high zone of J. Mago, proved of such very moderate interest in birds and beasts that we unhesitatingly decided after ten days of it to seek pastures new.

Now the roads became a difficulty.

On the evening of April 1, there commenced a series of cold storms of wind and rain, which not only kept washing away parts of the road, but gave me an attack of "flu."

Thanks to hard road-mending work, our friends of the police corps were able to get us back to Tetuan on April 4, by happy chance almost a fine day, in one of their light Ford cars, so we were spared the discomfort of having to stay "rained in" at Xauen, but our baggage could not be got through for another week. The return journey to Tetuan was as free from ornithological incident as the outward had been; the Choughs were still on the ploughs, but despite having got a gun ready, I stupidly missed my only shot, so never got a specimen: at Tetuan, on the Vega, Corn-buntings had now become numerous and chortling, and Swifts were flying about the town as well as Swallows.

It was a whole week of almost incessant storm before our baggage could be retrieved from Xauen, by which time my "flu" was well enough to travel on,

¹ "Mist."

but the storms held us up for yet another three days ; most of the fords we should have to cross between Tetuan and Tazerut were still uncrossable torrents. Had it not been for my illness and the bad weather, we might have improved our migration records during these ten days at Tetuan ; as it was, we did very little bird work there.

We had now completed the first half of our trip, and must own to having regarded its ornithological results through very blue spectacles : we had hoped for so much and achieved results mainly negative ! Our hopes for the second half lay almost entirely in Jebel Buhasem, in Raisuli's territory of Beni-Aros, which was known to contain a forest of large deciduous trees. This celebrated chief-tain and descendant of the Prophet, who had finally submitted, on terms, to the Spanish Government, about nine months ago, had given us a cordial *entrée* to his village Tazarut and his domains in general. On the 16th it was reported that the fords were crossable, so the following day, all, as usual, having been nicely arranged for our journey, we left Tetuan, in company with Mulay Moustafa, Pasha of Arzila and nephew of Raisuli, and after a two-hour motor-drive to Zoco Arba, and then a seven-hour ride, arrived at Tazarut just before sunset.

By our programme we should have had three weeks work in this neighbourhood, but this was reduced to little more than twelve days by the most appalling weather ; quite unprecedented in Moroccan April, so everyone assured us. From April 20 to 28 (inclusive) we had nothing but storms of wind and rain ; it was bitterly cold, and we were glad to abandon our tents and accept a more stable shelter in the shape of an empty barrack-room, kindly lent us by Mulay Ali, Pasha of Tazarut, another nephew of Raisuli. During all these nine days we were only able to work in the field for short spells now and again, during a brief clearing or when it was only "raining" instead of "deluging."

At last, with May, the proper fine spring weather set in, and we were able to explore J. Buhasem and its forest properly, and this time were rewarded in our finds.

The "big forest," i.e. the forest of big trees, covering some 10,000 acres (?), lies on the western side and northern facets of the J. Alam-Buhasem-Sugna range, between 3,000 and 5,000 ft., and is composed entirely of encinas, which, especially those on the northern facets, are fine trees with straight trunks. One of the largest of these oaks, which I judged to be about 80 ft. high, measured 10 ft. in girth at 4 ft. above its base—the general run is between two-thirds and half of that size.

Perhaps owing to the cold, sunless weather they were later than usual coming into leaf, but we were surprised to find in May (!) only the lowest ones in full leaf, and those towards the top still only in bud. The "big forest" peters out to the northward and southward of the Beni-Aros territory, and does not properly extend across the valley to the Sumata Mountains, our western *vis-à-vis*, although there too we could see patches of fairly good-sized encinas towards the tops.

Just below the "big forest" and merging into it, is a belt of cork-oaks, quite small trees with masses of saplings, interspersed with thick tracts of jungle—giant heath, arbutus, cistus, bramble, etc.

Below this "cork-belt," i.e. from about 2,500 ft., the mountains slope down

nearly to the valley¹ bottom at 1,200 ft., almost entirely in pasture, scrub, and boulders, Tazerut lies at 2,100 ft.

Raisuli's people have practically no agriculture or kitchen-gardens; they are pastoral folk, and obtain their grain and vegetables from neighbouring tribes in barter for their stock. Some toll is taken of the timber for building purposes, I think of quite negligible quantity at the present day; but the fact of there being several sacred groves, as well as isolated examples, of splendid old oaks and corks, down to 2,000 ft. on the otherwise bare slopes below the forest, is perhaps suggestive of the "big forest" having once extended lower down. If it did, it must have been a very long time ago.

One very important feature of the Beni-Aros country and its mountains, and one which at once struck us after coming from limestone Mago, is the sandstone formation. Thus here: encinas and corks, no pinsapos; copious water-supplies at the surface (right up to 5,000 ft. in some parts), supporting a good undergrowth of holly, laurustinus, bramble, arbutus, heath, etc., inside the forest; no special upper-zone plants like peonies, gooseberries, maples, etc. (though this may be partly due to altitude); the top of Buhasem is just a bouldery "moor" clad with a 2-foot growth of heath, etc., see Plate V, *d*.

On the hillsides, the vegetal character is very different from that of Mago's dried-up expanses; bracken, the heaths, and Cistaceae being especially luxuriant and (some) of different kind, excellent grazing where cleared and so forth.

Similarly, and of course in part consequent on the foregoing differences of environment, we found considerable difference in the bird-life of Beni-Aros, more especially in the "big forest." In the upper two-thirds of the "big forest," i.e. from about 3,600 ft. up to where at 5,000 ft. it peters out into small trees and the last 500 ft. of bouldery moorland summit, Woodpeckers Green and Great-spotted, Treecreepers, Nuthatches, Pied and Spotted flycatchers, Missel thrushes, Robins, Wrens, Firecrests, Stock and Wood pigeons were abundant, and these, though at first curiously silent, despite the fact that many of them were on the point of breeding, when the fine weather arrived, enlivened the forest with a chorus of song- and call-notes.

Migrants, represented daily by hordes of Swifts and Swallows with lesser numbers of House-Martins, swept the air overhead, Bee-eaters passed over chirruping in constant streams, Golden orioles flitted from tree to tree, shy troops of Barbary apes barked from safely distant tree top or crag towards the summit . . . here, there was always the expectancy of something fresh in the bird-line—Mago had been a "funeral."

In fact, all was extremely pleasant after the dearth and bad weather of the first part of our trip, save only for a perfect pest of the little blood-sucking "black-flies."² These horrid little creatures rose in swarms from the dead leaves and foot growth, to bite one's face and hands whenever one stopped for a moment: there was no respite from them, unless one could get into a breeze exceeding in velocity their maximum speed of flight about 8 m.p.h., and since this was seldom obtainable in the forest one had generally to submit to their persecution, with the result that the mere physical enjoyment of this otherwise charming place was

¹ Of the O. Tzelatza de Beni Issef, whose waters by circuitous route essentially reach the O. Luccus and Atlantic.

² *Simulium venustum* and *S. ornatum*—the same genus as the Newfoundland "black-fly" which is so troublesome to fishermen on the rivers there.

much spoilt. How long this plague continues I could not find out from the natives; they, however, seldom go into the forest, and were equally worried, but I believe it ceases about midsummer. The flies do not exist in the lowest parts of the forest, and when we camped at 3,800 ft. they mercifully retired at sundown for the night.

In the lowest part of the forest (i.e. below the "big forest") and its contiguous cork-belt there was very little bird-life; the jungles hold little more than an occasional Robin, Wren, or Blackbird, which could be heard oftener than seen; altogether, work there did not repay the struggle of pushing and crawling through the jungle.

Below the cork-belt the hill slopes, with their chequered scrub and pasture and huge sandstone boulders, were bright with Larks, Crested (*theklae*) and Wood, in full song, Little owls, Dartford and Sardinian Warblers, Stonechats and other breeding birds, while migrants, such as Ortolans, *Hippolais polyglotta*, Tawny pipits, etc. etc., were often very numerous (after the weather had cleared up), resting on their passage. The sacred groves and, more from their giving shelter to migrants, the orchards too, had plenty of bird-life.

The last four days of our stay in Beni-Aros we spent delightfully encamped at 3,800 ft. by the Col or Pass of Arosa Mensoja,¹ connecting J. Buhasem with J. Alam, the latter mountain famed for the shrine of the holy Mohammed Abd-es-salaam near its summit, and on May 8 we returned to Tetuan by the same way we had come.

Little in the bird line seemed to have changed on the route during the three weeks; a very few Short-toed larks, *hispanica* Wheatears, and Tawny pipits looked as if they would breed on the hitherto deserted "shaley" hill ridge separating the sandstone and limestone formations; the flocks of Choughs on the low ground had withdrawn, presumably into the mountains for breeding purposes, and Ravens in numbers were scavenging the Zoco Arba camp just as before.

Our last week was devoted chiefly to investigating, so far as we could, the effect of the Straits of Gibraltar as a separation "line" between species and subspecies of birds. This, we thought, could best be done by working woodlands in Sierra Bullones, as nearly similar in character to those fruitful and well-known ones just across the water near Algeciras.

But we found that, unfortunately, such delectable haunts do not really exist on the African side of the Straits, and the best we could do was to explore, first, a densely jungled valley with a sprinkling of cork-trees² on the south side of J. Musa (Apes Hill), and secondly a pretty little cork wood at Benzu, on the sea-coast to the north-eastward of the same Jebel. The former was extraordinarily deficient in bird-life, the only bird worth getting that we saw there was a Green woodpecker—from whom we were never separated by less than 200 yards of well-nigh impenetrable jungle, and the latter, only about 30 acres, was really *too small*: it held no Jays, Woodpeckers, Treecreepers, Robins, and, in fact, save Blue and Great tits, none of the birds that would best have suited our purpose.

And there were no other wooded places to go to.

Thanks to the kindness of Señor Rosende, the well-known Marine Engineer, and maker of Ceuta's fine new harbour, who gave us not only the use of his trains

¹ "The petrified bride," so called from a curious-shaped boulder on the Col, alongside the track.

² Typical of what is called later a "wooded jungle"; see Part III.

to Benzu but placed a steam-tug at our disposal on May 14, we also made a thorough inspection of the sea-coast for ten miles to westward of Ceuta, including the Isla de Perejil, in order to clear up the question of breeding gulls.

Irby was certainly mistaken in supposing that the blackbacked gull is anything more than a winter visitor to the Straits; the only sea breeding gull there is the "herring," of which we obtained four specimens out of a hundred seen.

Migration was still going strong at Ceuta; for instance, in the afternoon of May 13 every wretched little bush in a gully among the terribly arid hills outside the town seemed to hold one or more birds, Garden warblers, Rufous warblers, *Hippolais polyglotta*, Whitethroats, and other kinds. In its volume it reminded me more of our autumn "rushes" at Port Saïd than an episode of spring migration.

On May 16 we crossed to Algeciras, where I bade good-bye to my companions Señores Cabrera and Quiros, and on the 18th, all having again been made easy and delightful by Admiral and Mrs. Ellerton, sailed from Gibraltar for England with the collections in Orient line s.s. *Orvieta*.

PART III.—CATALOGUE OF BIRDS OBTAINED AND OBSERVED BY US IN YEBALA.

(a) The order, nomenclature, and index number of the species are those of Hartert and Jourdain's "The hitherto known Birds of Morocco," *Nov. Zool.*, xxx. 1923; but I only put the breeding * in our list for birds which gave us certain evidence of breeding in N.W. Morocco.

(b) The English name is that of the species (since many racial forms have never yet been given authoritative English names, and some care in giving and using English—as well as Latin—names is desirable).

(c) The specimens collected are indicated by the prefix "Coll." These, with the exception of a representation in the "Museo Nacional de Ciencias Naturales" of Madrid, are now in Lord Rothschild's Museum at Tring.

(d) Dr. Hartert and I "worked out" the collection together at Tring, comparing also with material in the British Museum and Witherby collections, aid we wish to gratefully acknowledge. The determinations are the joint result; the few exceptions in which we are not in complete agreement are alluded to in the text, and only concern minutiae of characters, whose accommodation in our system of classification, rather than the recognition of their existence, presents a difficulty from some points of view.

(e) For the sake of emphasis, notifications of certain species and groups which from past records we might have expected to, but did *not* meet with, are also included in this catalogue. Such references are made in smaller type in the text.

(f) References to Hartert and Jourdain's "Hitherto known Birds of Morocco," *Nov. Zool.*, xxx., are abbreviated as "H. and J.," with index number of species.

References to Lynes' "Ornithology of the Moroccan Middle Atlas," *Ibis*, 1920, are abbreviated as "M.A." with page number.

References to Henri et Alfred Vaucher, "Liste des Oiseaux . . ." *Rev. Franç. d'Orn.* 1915, are abbreviated as "Vaucher," with page number.

*1. *Corvus corax tingitanus* Irby. (Raven.)

Coll. 1 ♂, 27.3. Sex organs winter condition.

Common wherever we went. Each Spanish camp had its scavenging party of Ravens ; at Zoco Arba, a large camp, there were some twenty or thirty birds, at Xauen about sixteen, and only four at the small camp at Tazerut. They were to be seen thus during the whole of our visit, and apparently at all hours of the day, e.g. there seemed to be about as many at Zoco Arba at 3 p.m. on May 8 as there had been at 11 a.m. on March 4 ; and so elsewhere.

When disturbed and scattered, these packs of ravens were apt to break up into twos ; each bird ate its pickings on the spot, and altogether there was nothing at any rate suggestive of the pack as being composed of single birds finding food for breeding mates. Twos, not single, were the rule, apart from these congregations. They doubtless pair for life like our Ravens, but it is curious what a small proportion of the Moroccan birds *seem* to breed.

It was just the same in the Middle Atlas all through May, the nesting month there.

The only direct evidence we had of nesting was that of the pair fighting the Buzzards at their nest on May 7 (see 170).

(Note.) *Corvus corone* L. (Carrion Crow.)

On and over the Vega of Tetuan, we several times saw what we were almost sure were Carrion crows ; but never close enough to be quite certain. On March 21 there were some twenty, with a few Jackdaws, on March 24, April 4 and 9, single birds only, after which we saw no more.

The flock of twenty was apparently feeding among the young corn, and rose so wild when approached that the local " cazadors " failed to shoot any for us.

Drake's record may therefore be correct, and the Carrion crow a winter visitor.

2. *Coloeus monedula* subsp. (?). (Jackdaw.)

From March 19 to April 14, off and on, we saw Jackdaws frequenting the Beni-Hozmar slopes and the Vega of Tetuan. They were mostly in compact flocks of thirty to seventy birds, roving for food, which they seemed to find on newly ploughed fields, but our efforts to obtain specimens were not successful.

We saw nothing of the species anywhere else, nor in the above locality after mid-April, but quite likely they breed in the high crags of Beni-Hozmar and Beni-Hassan, which we never visited later than mid-April. Munn's record seems to me to put the Jackdaw definitely on the breeding-list.

3. *Pica* (Magpie).

Not observed.

*4. *Garrulus glandarius whitakeri* (Hart.). (Jay.)

Coll. 1 ♂ J. Mago ; 3 ♂, 2 ♀ J. Buhasem.

Only found in these two forests, and in Mago, evidently frequenting the few deciduous trees, not the conifers. In Buhasem forest plentiful from base (2,400 ft.) up to at least 4,000 ft.

Although paired when first seen on April 1, breeding was evidently to be

much later : sexual organs' evidence, and we found none other, pointed to mid-May being the earliest date for eggs.

In habits and note this Jay is just the same as our British bird, and also as its next-door neighbour of Central and South Marocco "*oenops*," from which form "*whitakeri*" is well separated by colour.

7. *Pyrrhonorax graculus* (L.). (Yellow-billed Chough.)

Near Zoco Arba, on March 24, and again at the same place on April 4, flocks of yellow-billed choughs were feeding on arable ground. I stupidly missed my only shot at them, so failed to get a specimen, but there was no doubt about the *yellow bill*—plainly visible at 25 yards to all three of us.

Pyrrhonorax (?) sp.

Flocks of Choughs were observed in April at J. Mago ; also in March at Quitsan, making, what seemed to be, diurnal flights between the Vega of Tetuan and Beni-Hozmar ; and finally, in mid-May we saw choughs circling round the tops of Sierra Bullones—very likely nesting there ; but as all these birds were only seen at comparatively long range and high in air no specific diagnosis was possible.

In Beni-Aros we saw no Choughs ; the small sandstone crags of Buhasem's top are unlikely breeding-places for them.

To clearly define the Chough status in North Marocco is well worth special effort ; so far, we have the Red-billed in the Great and Middle Atlas, and in certain parts of Southern Andalusia (Serrania de Ronda), etc. etc., and the Yellow-billed in North and Central Yebala and other parts of South Andalusia (Granada, Malaga) (Irby), etc. etc. Do any of these forms differ subspecifically from the typical ?

More work is required here.

8. *Sturnus unicolor* Temm. (Spotless Starling.)

9. *Sturnus vulgaris vulgaris* L. (Common Starling.)

We found no Starlings anywhere.

10. *Oriolus oriolus oriolus* (L.). (Golden Oriole.)

Golden Orioles first arrived in the woods of J. Buhasem on May 1 ; these evidently passed onwards and were more or less daily replaced by others, but there was no song to indicate breeding individuals up to the day of our departure, May 8. The Vaucher record as "*très abondant comme hôte d'hiver dans tout le Maroc*" is surely an error ?

11. *Coccothraustes coccothraustes*. (Hawfinch.)

Not observed, although in J. Buhasem and particularly in the small cork wood at Benu, seeing that the typical race nests commonly in the Algeiras cork woods, we thought to have found one or other of the races of Hawfinch.

12. *Chloris chloris aurantiiventris* (Cab.). (Greenfinch.)

Coll. 1 ♂, 1 ♀, 19.3. Sex organs winter condition.

Greenfinches were in small parties in the orchards and groves at Quitsan and Xauen in March, and at Tazarut in April and early May, but we noticed no evidences of breeding, and some of migration in March and April.

13. *Carduelis carduelis africana* (Hart.). (Goldfinch.)

Coll. 1 ♂, 23.4. Testes enlarging.

At Quitsan, about Tetuan, and at Xauen in March and the first half of April, goldfinches were fairly common in the orchards, but from the daily fluctuation in numbers and their restlessness and formation in small parties, we judged these birds, or at any rate the majority of them, to be on migration.

At Tazerut the species was not at all common, but had paired and would probably nest about mid-May in the orchards, but not at all in the forest, where we never saw the species.

14. *Carduelis spinus* (L.). (Siskin.)

Not observed.

*15. *Carduelis cannabina mediterranea* (Tschusi). (Linnet.)

Coll. 1 ♂, 23.4. Testes enlarging.

The Linnet is another Finch which evinced migratory movement, arrivals, departures, and restless movement in small parties, even so late as May 13 on the barren hillsides near Ceuta, but at Tazerut by the first week of May some individuals had paired and certainly selected their breeding sites on the "monte"-clad hill slopes.

16. *Serinus canaria serinus* (L.). (Serin.)

Fairly common at Quitsan, not at all common at Xauen; and I cannot find a note of even seeing a Serin at Tazerut! but I think there must have been one or two in the orchards there.

19. *Loxia curvirostra* L. (Crossbill.)

Not observed. There are a few small pine-trees at one point on the western slope of Beni-Hozmar, which may be the last remnant of a destroyed pine wood; and we thought we saw a few more in the distance towards the Northern Peña of J. Mago; but there is no likely present-day Crossbill habitat anywhere we travelled, nor is there elsewhere in Yebala, from all accounts.

*21. *Fringilla coelebs koenigi* Rothsch. & Hart. (Chaffinch of North Marocco.)

Coll. 10 ♂, 4 ♀.

This green-backed Chaffinch was one of the few really common birds, frequenting orchards, groves, even the taller "monte" and forests, as high as 6,000 ft. on J. Mago.

Cocks began to sing about the equinox, and the earliest evidence of actual breeding was a hen-bird building her nest 35 ft. up a 50 ft. oak-tree in J. Buhasem on May 7.

This race appears to me to be just (only) recognizable, by being on the average slightly smaller and darker than *africana*, into which form it grades.

22. *Fringilla coelebs coelebs* L. (Chaffinch of Europe.)

I am nearly sure the European Chaffinch in small parties was about Quitsan between March 15 and 20, but they were so restless and wild that we never brought off a successful shot to prove it.

These would be winterers; we certainly never saw any but green-backed chaffinches later.

24. *Petronia petronia* (L.). (Rock Sparrow.)

The Rock Sparrow was not identified for certain, but we are almost sure that a party of six flew past our motor-car near Zoco Arba on April 4.

*25. *Passer domesticus tingitanus* Loche. (House Sparrow.)

Coll. 7 ♂, 2 ♀.

The House Sparrow was common enough in the towns, villages, and camps.

The black bases to crown feathers of the ♂, characterising the form *tingitanus*, are less well illustrated in these Yebala specimens than in Algerian ones and identification has had to be based on the mass, not the individual, for two out of the seven collected are equally like *domesticus*.

[With forms of sparrows which are known, in certain localities, to interbreed with other forms, I think that without inconsistency one may well accept a higher proportion of "duds" than one does with the mass of bird kind when it comes to identification of Geographical Races.—H. L.]

26. *Passer hispaniolensis hispaniolensis* (Temm.). (Spanish Sparrow.)

We never saw the Spanish Sparrow anywhere.

27. *Emberiza calandra calandra* L. (Corn Bunting.)

From April 4 onwards the Corn Bunting was common and in song over the Vega of Tetuan. We never saw it earlier, and although this may well have been due to incomplete field-work there and the birds being out of song in March, we believe that the majority of (possibly all) these Tetuan Corn Buntings were only summer visitors.

At Tazarut we never saw the species; an absence or at any rate scarcity doubtless due to the country being pastoral, not agricultural.

28. *Emberiza cirrus* L. (Cirl Bunting.)

Coll. 1 ♂, 1 ♀.

Here and there. In Beni-Hozmar and El Hamas (Xauen's territory) we found the Cirl Bunting keeping to the valleys and hill bases, being replaced, above about 2,000 ft., by the Rock Bunting, but in this distribution, environment, independent of altitude, is of course the governing factor.

29. *Emberiza cia africana* le Roi. (Rock Bunting.)

Coll. 2 ♂.

We found the Rock Bunting fairly common about the rocky-stony-bushy parts of the lower zones of the Mountains (on J. Mago up to 4,000 ft.).

Our two specimens quite agree with ♂'s collected by Riggensbach in S.W.

Marocco, having the *short* grey throat and crop characteristic of *africana*, but in tint below, incline towards (richer) *cia*. The former character is, however, predominant and quite a good one for recognition.

30. *Emberiza hortulana* L. (Ortolan Bunting.)

Among numbers of other migrants observed on May 3 was one ♂ Ortolan—the first and, indeed, only one we saw—but we should doubtless have seen others had we worked the lower and open ground more, instead of the forest.

34. *Melanocorypha calandra calandra* (L.). (Calandra Lark.)

The Calandra Lark had apparently not arrived up to April 16, when we went to Tazarut, where the hill country is unsuited to the requirements of this plain-loving species, so we never saw it.

36. *Calandrella brachydactyla brachydactyla* (Leisler). (Short-toed Lark.)

The first Short-toed Larks arrived in the Vega of Tetuan about April 9; later, a few individuals looked like having selected their breeding sites on some bare uplands near Zoco Arba on May 8.

We obtained no specimens, so the identification above is only provisional.

38. *Galerida cristata* (? *kleinschmidti* Erl.). (Crested Lark.)

As we only saw *cristata* Crested Larks on the Vega of Tetuan, and not even around Ceuta, which is the hilly country, I formed the opinion that in Eastern Yebala the *cristata* lark is a coastal-plain inhabitant, giving way to *theklae* directly the ground begins to undulate, although the two species doubtless overlap to some extent in other parts of Spanish Marocco.

We collected no specimens, but it is only the Race, not the Species, that is in doubt, for we saw the birds quite close to.

40. *Galerida theklae erlangeri* Hart. (Short-billed Crested Lark.)

Coll. 10 ♂, 6 ♀.

The Short-billed Crested Lark was common everywhere, frequenting the hill slopes, whether "monte" pasture or arable, from their bases up to 1,500 ft. about Xauen, and 2,500 ft. at Tazarut, at which altitudes rocks, cliffs, or trees begin to make an unsuitable habitat. Unlike the Wood Lark, this species does not reappear on the "moorland" mountain-tops.

By mid-March some were paired and cocks singing, but nesting did not commence until well on in April.

On May 2 we flushed a bird from her nest of four eggs slightly incubated.

We made a special point of obtaining a series of these birds from near Tetuan, the type-locality of Señor Cabrera's *G. t. berengueri* (*Boletín de la Real Soc. Esp. de Hist. Nat.*, January–February 1922, p. 11) obtained by himself in November 1921, and Hartert and I agree that his bird is only *erlangeri* in *fresh* plumage, with the "pale edgings" (mostly to be abraded away before the next breeding-season) showing as a conspicuous colour feature of the secondaries.

In a series, it is noticeable that *erlangeri*, like other Crested Larks, is liable to considerable variation in colour of under parts; often due to soil-staining.

41. *Galerida theklæ ruficolor* Whit. = *G. c. aguirrei* Cabrera.

In addition to sending us from the Madrid Museum a topotype of his *G. t. berengueri*, Señor Cabrera has kindly sent one of his *Galerida theklæ aguirrei* described in the same *Boletín*. This is a May-bird from the type locality, the "Garet" in "the low Rif" (mihi).

After comparing it with a good series, we find it to be inseparable from *ruficolor*, of which race it is an example in rather worn plumage.

Both races show considerable difference between their "fresh" and worn plumages. We are glad to be able to add that Señor Cabrera agrees with us in cancelling both names *berengueri* and *aguirrei*.

42. *Lullula arborea harterti* Hilgert. (Woodlark.)

Coll. 5 ♂.

Although less numerous on the lower slopes than the *theklæ* lark, the Woodlark is also there, and in addition ranges much higher, for instance at Buhasem it was as plentiful on the heath-clad "moorlands" of the summits at 5,500 ft. as on the lower slopes at 1,700 ft.

Considering that in the Middle Atlas at 4,000–5,000 ft. altitude Woodlarks began to nest in March, and their song was to be heard on all sides in April, and that much the same may be said of the species in South Andalusia, the Yebala Woodlarks seemed extraordinarily late in breeding, for although some were paired as early as mid-March it was quite rare to hear their song, and then only a few poor snatches, until the beginning of May, and right up to May 6 the sexual organs of our specimens were, none of them, up to breeding condition.

Surely in a species whose individuals are certainly resident, all this lateness could not have been merely the effect of the stormy spring? If so, it would be against my own experience.

Dr. Hartert and I agree that although for a complete description in writing of this race a series of *freshly moulted* specimens is still required, there is no doubt that the "North African" Woodlark is distinguishable in worn plumage by the characters given for *L. a. harterti* Hilgert, and that consequently the "?" in H. and J. 42 may now be removed.

43. *Alauda arvensis* L. (Skylark.)

We probably arrived in Jebala too late for wintering skylarks, since we saw none, and the species is one of the earliest to leave Mediterranean winter quarters, e.g. in Crete all had left by the end of February.

As regards the Skylark of non-typical but still undefined race, which breeds on the Middle Atlas Plateau (see M.A., p. 291), Yebala for certain, and judging from what we know of its physical geography, the whole of Spanish Morocco almost certainly, contains no high elevated "downs" or plateaux to provide that environment which seems to be required by Skylarks breeding in Mediterranean latitudes.

44. *Eremophila alpestris atlas* Whit. (Shorelark.)

What has been said of *breeding* Skylarks, applies equally to the Shorelark; neither species is at all likely to occur in Spanish Morocco.

45. *Anthus campestris campestris* (L.). (Tawny Pipit.)

Coll. 1 ♂, 13.5, testes large.

Tawny Pipits first appeared in the Vega of Tetuan the second week of April. These were certainly on migration, but the single ♂ (obtained), and a pair seen on the dry hill tops near Ceuta on May 13 were quite likely about to breed there.

The Vaucher record as "hôte d'hiver" is surely an error?

46. *Anthus trivialis trivialis* (L.). (Tree Pipit.)

A migration of Tree Pipits coincided more or less with that in April of the preceding species. I think it is very improbable that any Tree Pipits winter in North Morocco.

47. *Anthus pratensis* (L.). (Meadow Pipit.)

Coll. 1 ♀, 24.4.

Meadow Pipits were plentiful in small parties when we arrived in mid-March. These individuals, presumably winterers, appeared to have left for the North by about the Equinox, after which the species was only intermittently represented by what were, evidently, emigrants; the last one seen (and obtained) being at Tazarut on April 24, during a brief clearing between rain-storms.

48. *Anthus cervinus* (Pall.). (Red-throated Pipit.)49. *Anthus spinoletta petrosus* (Mont.). (Rock Pipit.)

Neither of these species was seen.

50, 51, 52. *Motacilla flava*. (Yellow Wagtails.)

We did not actually see any Yellow Wagtails, but would of course have done so had we been more in suitable places for them, such as the Vega of Tetuan.

*53. *Motacilla cinerea cinerea* Tunst. (Grey Wagtail.)

Coll. 1 ♂ 31. 3, 1 ♀ 3.4 Xauen breeding.

Two breeding pairs frequented the cascading "Raas-el-Ma" at Xauen during our visit there; the ♀ obtained would have commenced to lay in about a week's time.

In view of this, we were surprised not to have met with the species up the very suitable Quitsan stream in March, but perhaps the birds are not resident in North Morocco?

55. *Motacilla alba alba* L. (White Wagtail.)

A White Wagtail, probably on migration, was noted on the Vega of Tetuan on March 21, and I think we saw others elsewhere, later, but cannot find the record in my notes.

[*57A.] *Certhia brachydactyla brachydactyla* Brehm. (Treecreeper.)

Coll. 7 ♂, 4 ♀, 1 ? sex.

The Treecreeper was found only in the forests of J. Mago and J. Buhasem. In the former, the thick foliage of the "pinsapos," and the silence of the birds at so early a season, made them very difficult to locate, but enough were seen (two shot) to suggest a fair stock there, and in J. Buhasem the species was plentiful, singing, and on the point of breeding when we left on May 8; earlier, that is, than with *mauretanica* in the Middle Atlas (see M.A., p. 292).

Our twelve specimens all agree in being darker (and somewhat less rufescent) above than *mauretanica* and cannot be ascribed to that form. Spanish birds are generally classed as *ultramontana*, but the Yebala birds and a number of

Spanish specimens seem to me so like *brachydactyla* that I have thought it best to use the typical name for the Yebala birds.

58. *Tichodroma muraria* (L.). (Wall-creeper.)

We did not find the Wall-creeper anywhere.

Re H. and J., 58. In 1892, since no European would have been likely to venture farther south than a few miles from Tetuan, the mountains visited by M. Henri Vaucher were presumably those Beni-Hozmar, whose summits we did not manage to reach.

But although crowned with imposing limestone crags, these mountains only attain a maximum altitude of 3,600 ft., and so far as we could tell from their middle zone gave little promise of anything special higher up.

In all their physical features, these mountains of Yebala are nearly identical with the minor Sierras and Serranias of Southern Andalusia, where neither Wall-creeper nor Alpine Accentor are known to occur, and in view of what we know of the distribution and habitats of these two species I doubt whether it would be wise to accept them in the Moroccan list as other than "possible rare vagrants" (e.g. their status on our British list) until positive evidence to the contrary is forthcoming.

*59. *Sitta europaea hispaniensis* With. (= *atlas* Lynes). (Nuthatch.)

Coll. 13 ♂, 8 ♀, J. Buhasem.

1 ? sex, J. Mago.

Like the Treecreeper, the Nuthatch was found to occur only in the forests of J. Mago and J. Buhasem.

Judging as much from my Middle Atlas experience as from finding the birds so scarce in early spring on J. Mago, I expect the Nuthatch will prove to be not plentiful there owing to the scarcity of deciduous trees, but in the oak forest on J. Buhasem the species was quite abundant between 4,000 and 5,000 ft. wherever the trees were a good size, less so above and below those altitudes.

Towards the end of April the birds commenced courting, and on May 6 a ♀, probably one of the earliest breeders, was shot beginning her nest (with dead oak leaves) in a natural hole 20 ft. up a 30 ft. tree.

When I described *atlas* (Bull. B.O.C., November 1919) the only Nuthatches available for comparison with the Middle Atlas specimens, from nearer to Morocco than the area of *caesia*, consisted of but four specimens from Central Spain and Portugal in the Rothschild and Witherby collections, representing *S. e. hispaniensis* With. (Bull. B.O.C., xxxi. p. 78) = *S. e. minor* Brehm (vide Vög. Pal. Fauna, p. 2106); and although the Middle Atlas birds were like enough to some of these, they differed about equally from the actual type-specimen of *hispaniensis* and from the average *caesia*.

The distinctions were in either case small; a larger series of the Iberian bird was evidently necessary, hence in describing *atlas* I compared with the well-known *caesia*, in order to provide a more stable description than one with little-known *hispaniensis*.

But during the last four years Mr. and Mrs. Witherby have collected a fine series of Nuthatches from Central Spain and Portugal, which show clearly that the Tring type of *hispaniensis* is just one of those unfortunate cases in which the "type-specimen" happens to illustrate the extreme of individual variation from the racial aggregate, and above all, we arrive at the satisfactory finding that the *Portuguese, Central Spanish, Yebala, and Middle Atlas birds are all racially identical.*

Hartert, Witherby, and I therefore agree that *atlas* becomes a synonym

of *hispaniensis*, and that the following description of the form should be substituted for that given in *Bull. B.O.C.*, xxix. p. 76 :

“ *Sitta europaea hispaniensis* Witherby.

“ Bill *finer* and slightly shorter than either *caesia* or *britannica* ; under parts paler than *caesia*, that is like *britannica*, but chestnut of flanks dark, like *caesia*.”

If Olcese's “ five or six Nuthatches ” came from North Marocco, they may have been brought to him from Beni-Aros by a native collector, as indeed *may* many of both the Tangier dealer's specimens.

In the light of its “ low rolling montañas,” and the past thirty-eight years of ornithological record from near Tangier, I confess to having regarded this particular record, ever since the discovery of the Nuthatch in the Middle Atlas, as not worth more than “ the likelihood of there being a Nuthatch in North Marocco.”

[Doubtless many records originating with the Tangier dealers do not refer to the immediate neighbourhood of Tangier, but to anywhere in the Tangier Peninsula to Ceuta, etc.—E. H.].

***60. *Parus major excelsus* Buvry. (Great Tit.)**

Coll. 4 ♂, 2 ♀.

We found the Great Tit everywhere, including Benzu in the extreme north, and fairly common up to 5,000 ft. altitude so long as there were a few trees, wild or cultivated, any sort except possibly the conifers.

A ♀ (by ovary) laying eggs flew from the wild storm raging without into the lighted “ loggia ” where the Cherif Raisuli was entertaining us at a banquet on the night of April 29. Her capture, made easy by the fact that she damaged herself at the lantern, created a diversion.

****Parus coeruleus ultramarinus* Bp. (Blue Tit.)**

Coll. 11 ♂, 4 ♀, 1 ? sex.

About the commonest and most widespread resident bird we met in Yebala. In our experience, there seemed scarcely any sort of country at moderate altitudes where one should not expect to find this lovely little Blue Tit. Neither did we find any diminution in its numbers or variation (in the aggregate) in its plumage colour up to the very brink of the Straits of Gibraltar, which abruptly terminates the northern extension of its very distinct Race.

62. *Parus ater atlas* Meade-Waldo. (Coal Tit.)

Coll. 1 ? sex, 1, 4, J. Mago.

Our single specimen of the Coal Tit was one of two in company in the Pinsapo forest. Another two were seen there the same day, but the species was not in Beni-Aros, probably because of the absence of conifers there.

In the Middle-Atlas these birds, though often in the ilex-trees, were never far from the cedars, and were most abundant in the cedars of the upper and middle forest.

Our specimen quite agrees with *atlas*, whose known range is thus extended some way farther north.

***63. *Regulus ignicapillus ignicapillus* (Temm.). (Firecrest.)**

Coll. 4 ♂, 1 ♀, J. Buhasem.

Several Firecrests were seen in the Pinsapo forest on J. Mago at 6,000 ft., and the species was quite plentiful in the Oak forest on J. Buhasem, where on May 6 at 4,700 ft. we watched a ♀ attended by her mate, building their nest in a frond of "hair" lichen, hanging from a big holly bush. The following day another ♀ Firecrest was seen carrying (outer) nest material.

Judging from there being no previous records of the species in North Marocco, it seems possible that in Yebala the Firecrest is confined to these two localities (in common, it may fairly be said, with the Nuthatch and Treecreeper).

****Lanius excubitor algeriensis* Less. (Grey Shrike.)**

Coll. 2 ♀.

All we saw of Grey Shrikes was two pairs, one in the valley of the Wad Lau at 1,200 ft., the other at Tazarut at 2,000 ft. near the village.

In both cases the ♀ was shot. By sexual organs, the former on March 27 was just about to begin laying eggs, the latter, on April 28, had already laid hers, but we could not find either nest.

Like *meridionalis* of South Andalusia, *algeriensis* is evidently an early breeder in Yebala.

66. *Lanius senator senator* L. (Woodchat.)

The first few Woodchats arrived and passed on during the last days of March, but it was not until the middle of April that the passage of the species became marked. On April 14, in favourable passage weather the hill slopes just above the Vega of Tetuan were crowded with Woodchats, certainly only on migration, since there were no suitable breeding sites there; but all the same we found them impaling large Blister Beetles (*Mylabris*) on low thorn bushes, a habit I had believed to be associated only with nesting.

We have no notes of the species at Tazarut; very likely it breeds thereabouts, but it is certainly not the "abundant summer visitor" there, like it is all over the lowlands of South Andalusia.

67. *Harpolestes senegalus cucullatus* (Temm.). (Tschagra.)

On March 16, in some brambles near Quitsan, we roused a single inquisitive Tschagra, who unfortunately got away badly wounded. But never a sign of another anywhere else; although we explored many suitable-looking and similar spots, so that the species cannot be very widespread in Yebala, though it may, of course, be locally not uncommon.

68. *Pycnonotus barbatus barbatus* (Desf.). (Bulbul.)

Coll. 1 ♂, 1 ♀.

The Bulbul was fairly common in the orchards, which, in our experience, are very rarely higher in altitude than 2,000 ft., and the species certainly does not inhabit either of the two forests we visited.

***69. *Muscicapa striata striata* (Pall.). (Spotted Flycatcher.)**

Coll. 3 ♂, 1 ♀.

Spotted Flycatchers began to arrive at Tazarut on May 1, and thenceforth were plentiful, both in the orchards and the forest above, but we left too early to witness breeding operations there. In the Benu cork wood the species was common; we collected a pair with a half-built nest there on May 15.

The Vaucher record as "pas rare en toutes saisons" is surely an error.

***70. *Muscicapa hypoleuca speculigera* Bp. (Pied Flycatcher [Southern].)**

Coll. 5 ♂, 1 ♀, Tazarut, 24.4 to 6.5.

This breeding Race of Pied Flycatcher began to arrive at Tazarut about a week later than the first migrants of the Northern (typical) Race.

Field recognition of *speculigera* from *hypoleuca*, based on the large white forehead patch, and aided by the purer black of 90 per cent. of the former, is quite practical—in fact, so far as my own experience here and in the Middle Atlas goes, it is infallible if one adopts the principle of disregarding rare "doubtfuls."

Although *speculigera* was occasionally found on the bushed slopes, during what were probably their first few hours (or minutes ?!) of arrival, it was quite obvious that they very soon found their *home* in the forest mainly between 4,000 and 4,800 ft. altitude, where they soon became plentiful, paired, and about to breed when we left on May 8.

71. *Muscicapa hypoleuca hypoleuca* Pall. (Pied Flycatcher [Northern].)

Col. 3 ♂, 3 ♀, Tazarut, 18.4 to 2.5, 1 ♂ Benu, 15.5.

(*Vide* remarks on preceding.) The Northern Pied Flycatchers, who passed through Tazarut in numbers, more often frequented the groves and orchards and lowest zone of the forest than anywhere else.

The specimen shot at Benu in mid-May gave no indication, either by sex organs or behaviour, of breeding there, and was doubtless one of the "belated migrants" suggested in H. and J. 70.

72. *Phylloscopus collybita collybita* (Vieill.). (Chiffchaff.)

Coll. 1 ? sex, 15.3. (This species only for identification, not preserved.)

Chiffchaffs were numerous up to the first week of April. Up to the third week of March they seemed to be winterers, after which daily fluctuation of their numbers and other indications suggested departure of the winterers and the migration of fresh individuals.

We saw none for certain after April 16, and probably none breed in Yebala. If the Chiffchaff had been either in the Buhasem forest or the little Benu cork wood, we should certainly have *heard* it, for on May 17 we found the species in full song (the peculiar song recorded in *Ibis* 1914, pp. 304 et seq.), and a completed nest near Almoraima.

I think it as well to mention this, for although H. and J. give the Chiffchaff as a non-breeder in Morocco, it is reported as breeding in Algeria, and does so abundantly just on the other side of the Straits of Gibraltar.

73. *Phylloscopus trochilus trochilus* (L.). (Willow Wren.)

Coll. ♂ 15.3, ♀ 14.4, ♀ 12.5, 2 ♀ 15.5, sex organs minute.

The Willow Wren is certainly, in the rule, only a migrant in North Morocco, but remarkable though it be when the known winter range of the species is considered, records exist tending to show that a few (exceptional ?) individuals spend the winter so far north as Morocco. Our specimen of March 15, one among many Chiffchaffs, may have been such a one.

With regard to Irby's "breeds near Tangier," I think my explanation in *Ibis*, 1914, p. 312, explains *how* he probably made his mistake about the Willow Wren breeding near Gibraltar, and applies equally to Morocco; and I quite agree with H. and J. in rejecting Irby's status of the species.

With us in Yebala, a strong passage of Willow Wrens began in mid-April, and continued off and on right up to our last day in Morocco, May 15. No sex organs examined gave the slightest indication of breeding.

74. *Phylloscopus bonelli bonelli* (Vieill.). (Bonelli's Warbler.)

Coll. 1 ♀, 1 ♂, 2.5, J. Buhasem, ♀ 14.5, Benzu.

Bonelli's Warbler only began to arrive (in Beni-Aros) in early May, so our departure thence on May 8 gave us no opportunity of seeing whether the species breeds there or not.

In the Benzu cork wood on May 14, there were quite a few Bonelli's Warblers, but all were silent and the sex organs of our specimen quite small.

But they are late breeders both in the Campo de Gibraltar and in the Middle-Atlas, and most probably also in North Morocco.

75. *Phylloscopus sibilatrix* (Bechst.). (Wood Wren.)

Coll. 1 ♀, Tazerut, 2.5, sex organs minute.

The above specimen was the only Wood Wren we saw for certain.

76. *Cettia cetti cetti* (Temm.). (Cetti's Warbler.)

Coll. 1 ♂, Xauen, 31.3.

Cetti's Warbler was rather common in the bramble and cane jungles overhanging the streams at Quitsan and Xauen. Doubtless also we should have found it on the Tazerut stream, had we gone down it a little farther, for Cetti's Warbler, so far as my Mediterranean experience goes, besides being a resident is everywhere a bird of low altitudes.

77 to 82. Genera *Locustella* and *Acrocephalus*.

We saw nothing of either genus, but our work in Yebala lay for the most part in unlikely ground for any of their representatives, even if on passage.

83. *Hippolais polyglotta* (Vieill.). (Melodious Warbler.)

Coll. 2 ♂, 2 ♀.

Melodious Warblers first appeared at Tazarut on May 2, in numbers, migrating, silent, and mostly frequenting small dry bushes—a state of affairs that continued up to May 15, except that on that day—our last in Morocco—one pair at least out of the numbers seen at Benzu had selected their nesting site among the oleanders, and the ♂ was singing.

84. *Hippolais pallida opaca* Cab. (Pallid Warbler [Western].)

We have no record of the Pallid Warbler, but probably overlooked it, although it is notoriously a very late-arriving summer visitor to the Mediterranean.

85. *Sylvia hortensis hortensis* (Gm.). (Orphean Warbler.)

Coll. 1 ♀.

A few Orphean Warblers were seen ; first on May 2—and off and on subsequently, but all on passage ; even on May 15 a ♂ shot at Benzu had testes scarcely at all enlarged. We left the country too early to be able to say as to the species breeding at Yebala : it doubtless does so, as H. and J. remark.

86. *Sylvia borin* (Bodd.). (Garden Warbler.)

Coll. 3 ♂, 1 ♀, all sex organs small.

The garden warbler first appeared in mid-April (J. Buhasem, April 17), after which the species became more or less frequent, even abundant near Ceuta during our stay there (May 11 to 16), but the birds were always silent, and we could find no evidence whatever in support of their breeding anywhere in Yebala.

I think there can be little doubt that the species is only a passing migrant in North Morocco.

87. *Sylvia atricapilla atricapilla* (L.). (Blackcap.)

Coll. 1 ♂.

Blackcaps were abundant during the whole of our visit to Quitsan and Xauen (March 16 to April 4), the large majority, if not all, being on migration, which evidently commences early in the year, and ceases about the end of April. As I have often noticed in Andalusia, the earlier parties, those for instance at Quitsan March 15 to 21, were composed almost entirely of cocks ; the hens follow later. A few Blackcaps were courting and singing, both at Xauen at the end of our stay there, and in the Buhasem forest, and would be pretty sure to breed there a little later on, but to say whether these individual pairs were resident or only summer visitors would be pure guesswork.

***88. *Sylvia communis communis* Lath. (Whitethroat.)**

The Whitethroat was never plentiful; we noted its first occurrence on March 31, a pair and a single cock, and thought them on migration. Later we saw a few everywhere we went, and a hen shot on May 6 at 4,000 ft., in a forest clearing, was in the middle of laying her eggs.

***89. *Sylvia melanocephala melanocephala* (Gm.). (Sardinian Warbler.)**

Common, and I believe resident, everywhere, except in the big forests and heights.

On J. Mago up to about 4,600 ft., where the lowest of the high-zone plants occur—not higher.

***90. *Sylvia cantillans* (probably *inornata* Tschusi). (Subalpine Warbler.)**

Coll. 1 ♀, 6.5.

The Subalpine Warbler must be scarce in Yebala. On March 24 I was nearly sure of hearing the Subalpine's rather distinct call-note in a thick bush,

but never saw one until May 6, when, in a forest clearing at 4,000 ft., I shot a ♀ about to lay eggs.

Unfortunately females of *cantillans* cannot be recognised with certainty from *inornata*.

91. *Sylvia conspicillata conspicillata* Temm. (Spectacled Warbler.)

It was a surprise not to find the Spectacled Warbler in so likely a place as the dry slopes below Xauen, but we never saw one anywhere.

*93. *Sylvia undata toni* Hart. (Dartford Warbler.)

Coll. 7 ♂, 4 ♀, nest 4 eggs, 29.4.

A fairly common and almost certainly resident bird of the scrub, and one with considerable range of altitude in Yebala, e.g. near Xauen from the Lau valley 1,100 ft. up to 5,300 ft. on J. Mago. Not observed above 3,600 ft. in Beni-Aros.

Like British and Continental Dartfords, *toni* is very conservative to a particular kind and density of scrub-growth, and this elusive little bird is like to be sought in vain at *any* altitude if the bushes are not "just so."

Earliest eggs were probably laid about the third week of April; the nest of April 29 had four eggs, almost fresh, of the "brown," not "red" type.

Our specimens illustrate the ultimate expression of *toni* being extremely dark, slaty-black above, without even the suspicion of brownwash that is noticeable in most Algerian specimens.

94. *Agrobates galactotes galactotes* (Temm.). (Rufous Warbler.)

Coll. 1 ♂, 13.5.

The Rufous Warbler was probably unusually late in coming to Marocco this year; we never saw one until May 13, and then they appeared in quantities in the gullies among the Ceuta hills, evidently on passage. This is about ten days later than Irby's record for Gibraltar.

It is such a conspicuous bird, I feel sure we cannot have overlooked it earlier.

95. *Cisticola juncidis cisticola* (Temm.). (Fantail Warbler.)

The Fantail Warbler was always to be seen in the Vega of Tetuan, but we visited no other places suited to the requirements of this plain and lowland species.

*98. *Turdus viscivorus deichleri* Erl. (Mistle Thrush.)

Coll. 2 ♂, 1 ♀, nest 3 eggs, 2.5.

We only found the Mistle Thrush in Beni-Aros, where it was quite plentiful at all altitudes in the forest and occasional in some of the detached groves below it.

The nest of May 2 was only 5 ft. above the ground, near the end of one of the lowest boughs of a huge old cork tree in a sacred grove. See Plate IV, *d*.

Both nest and eggs were typical Mistle Thrush's; the first of the eggs must have been laid on or about April 21.

99. *Turdus philomelos philomelos* Brehm. (Song-thrush.)

Coll. 1 ♀, 18.3.

Song Thrushes were frequent at Quitsan, and judging by their restlessness, probably on the move northward. These were probably local winterers. Later on, at Xauen and in Beni-Aros, others seen off and on were certainly only passing through, having wintered further south.

April 26 is our last record of the species.

97. *Turdus pilaris* L.**100. *Turdus musicus* L.****101. *Turdus torquatus* L.**

We never saw any Fieldfares, Redwings, or Ring Ouzels, and from such experience as we obtained I am not optimistic about there being a breeding race of Ring Ouzel in Yebala.

102. *Turdus merula algirus* (Mad.). (Blackbird.)

Coll. 5 ♂, 2 ♀, nest 4 eggs, 3.5.

Plentiful wherever we went, chiefly in and about the orchards and groves, but also in the Buhasem forest. On Mago occasionally as high as 4,600 ft., but probably no higher. These Blackbirds are extraordinarily shy, they cluck away in thick bushes, and scarcely ever appear in full view, except when bustling off into another piece of cover, or in the case of the cock, when singing on a bough above the bushes. Consequently we had great difficulty in collecting hens which have the distinctive "grey," not "brown" coloration.

There seems otherwise no field difference between *algirus* and *merula*; nest and eggs are the same.

104. *Monticola saxatilis* (L.). (Rock Thrush.)

Coll. 1 ♀, 30.4.

We only saw Rock Thrushes on the bare top of J. Buhasem, the single ♀ collected on April 30, whose ovary, was quite small, and a ♂ and ♀ *not* paired, and showing no signs of breeding there on May 5. If the species breeds there, which is likely enough, it must be later in the season; all our birds behaved as if on passage. In the Sierras of Andalusia the species, according to my experience, commences to breed about mid-May.

105. *Monticola solitarius solitarius* (L.). (Blue Rock Thrush.)

Seen, in all localities visited by us, in suitable places, preferably crags, small and large. No evidence of migration among those we saw. On Mago up to 6,000 ft.; on Buhasem up to the summit (5,500 ft.).

106, 107. *Oenanthe oenanthe*. (Wheatear.)

The scarcity of Wheatears of all sorts was most marked. A few ♂ *oenanthe* seen in the Vega of Tetuan, April 9 to 14, representing first arrivals, and one ♀ (perhaps two) at Tazarut on April 23 were all we ever saw of *oenanthe*.

109. *Oenanthe hispanica*. (Black-throated, Black-eared Wheatear.)

A single ♂ on 24th, another on March 27, both migrants, in the valley of the Oued Lau, and two pairs probably breeding on the bare hill-sides between Tazarut and Zoco Arba on May 8, represented all we ever saw of *hispanica*. And yet *all* the lower hill country looked ideal for the nesting requirements of this conspicuous and, *par excellence*, Mediterranean-breeding species!

110. *Oenanthe leucurus* (Gm.). (Black Chat.)

Despite all the admirable Black Chat ground that we worked, we never saw a single bird anywhere.

*111. *Saxicola torquata rubicola* (L.). (Stonechat.)

Coll. 4 ♂.

Just at first, in mid-March, Stonechats were common enough, then seemed to follow a total blank until nearly mid-April, after which, until the end of the month, although some seemed to be paired, daily fluctuation in numbers indicated some degree of passage migration.

At the beginning of May a few pairs at Tazarut had certainly settled-in, and were breeding in spots we had constantly inspected earlier, without seeing Stonechats, and there were no further evidences of migration.

Our travels in the first half of the trip rather prevented the continuous observation required for a definite conclusion, but I begin to doubt whether all (or any of ?) the Yebala stonechats are "resident," although it is of course beyond doubt that numbers are so in many parts of the "Mediterranean."

The point could easily be cleared up by any Tetuan resident who cared to give his attention to it in March and April.

112. *Saxicola rubetra rubetra* (L.). (Whinchat.)

Whinchats were seen off and on from April 9 to May 13, but never more than one or two at a time. These were certainly all migrants. Surely the Vaucher record as "surtout hôte d'hiver" is an error.

114. *Phoenicurus phoenicurus* (L.). (Redstart.)

Redstarts, almost certainly of typical race and on migration, were frequent up to May 1. There was no suspicion of any Redstart breeding in the Buhasem forest; in fact, we never saw but one in it, so that probably *algeriensis* does not come so far north as Yebala.

115. *Phoenicurus ochruros gibraltariensis* (Gm.). (Blackstart.)

Not uncommon at Quitsan and Xauen, J. Mago up to 5,400 ft., but none seen between April 1 and May 14, when a single ♀ was observed on Perejil Island, certainly not breeding there, probably a straggler.

The status of the species in Yebala is probably "winter visitor and migrant."

116. *Diplootocus moussieri* (Olphe-Galliard). (Moussier's Redstart.)

Coll. 1 ♀, 26.3.

I cannot give much information about this species. We never saw any cocks, and the hens are too like hen Redstarts to be quite sure of field diagnosis. On J. Mago there were certainly a few; our specimen was one of two ♀'s in the

burnt scrub at 4,200 ft., her ovary still in winter condition. In Beni-Aros they seemed absent, but I think we saw one or two ♀'s at Quitsan.

*117. *Luscinia megarhyncha megarhyncha* Brehm. (Nightingale.)

Coll. 1 ♀.

The first nightingales arrived at the end of March. After mid-April their song was to be heard in most of the damp "bottoms," where they were undoubtedly breeding, as proved by the ovary of our specimen. The Vaucher record as "hôte d'hiver" is surely an error?

118. *Luscinia suecica* (L.). (Bluethroat.)

On March 21, when riding across the Vega of Tetuan, we had a momentary glimpse of a bluethroat at an overgrown irrigation course.

*119. *Erithacus rubecula atlas* Lynes. (Robin.)

Coll. 1 ♀ 17.3, 1 ♂ 19.3; 5 ♂, 1 ? ♂, 30.4 to 7.5.

Robins rather puzzled us. At Quitsan, March 15 to 21, there were plenty, and although the only two we shot there are inseparable from the Beni-Aros specimens, I think wintering *rubeculas* must have been at Quitsan too, because we constantly had glimpses of very brown-backed birds, flitting elusively between bushes.

Then about Xauen, March 24 to April 4, Robins were so scarce (or absent?) that we never even saw one for certain, whereas in Beni-Aros they were plentiful and on the point of breeding when we left on May 8.

Altogether, the Western Mediterranean Robins want more investigation and study, both as to kind and status.

So far as numbers go, the combined series in the British Museum, Tring, and Witherby collections are good, but as very few of the collectors have recorded, by label or otherwise, more than (if as much as!) a date and locality with their birds, scarcely any of the autumn and spring specimens can be used as data for status. Consequently in reality the series are *not* good. The fact is, and in this Dr. Hartert and Mr. Witherby agree with me, all these South European - North African robins are uncommonly close to one another, and until good series of fresh-plumaged and properly labelled (*breeding and non-breeding*,¹ etc.) specimens are available, so long will the bird remain a puzzle.

To me it seems that the "nutshell" analysis of the Race question of these Southern Robins now stand thus:

	Compared with <i>rubecula</i> .
<i>atlas</i> , breeders from Middle Atlas (typ. loc.). . . .	{ Above, like but no tinge of rufous. Below, richer, more like <i>witherbyi</i> .
<i>atlas</i> , breeders from Yebala . . .	ditto, but earliest specimens show a suspicion of brown tinge on rump and prox. outer webs of tail feathers, which tinge may be more wide-spread still—in quite fresh-plumaged birds.
<i>witherbyi</i> , breeders from Algeria (typ. loc.). . . .	{ Above, browner. Below, richer.

In all three Races—no tangible difference in size and (*at present*) colour characters so near one another that it is seldom possible to satisfactorily ascribe single examples from intermediate localities to any particular one of the three Races.

¹ Which item, in the case of the late spring and early autumn birds, may often be impossible and seldom can be done without careful field observation.

On the whole, I suspect that when we get proper Series, opinion will incline towards calling all *rubecula*, but consider that all three "races" should be maintained until then.

It would go a long way towards the solution of this little problem if some of our ornithological friends resident at Gibraltar¹ and in Yebala would take the matter up; plenty of good field-work, and comparatively little slaughter necessary.

121, 122. No *Prunella* sp. seen.

123. *Troglodytes troglodytes kabyloorum* Hart. (Wren.)

Coll. 8 ♂, 2 ♀, nest 3 fresh eggs, 2.4.

Plentiful in all localities. Abundant up and down the torrent at Xauen, and up to 4,000 ft. on Mago, but seldom to be found far from water and damp spots with thick undergrowth.

Singing merrily from March 16 onwards, typical song.

I caught a ♀ sitting on her three eggs on April 2; the nest was built into a shallow cavity in one of the piers supporting the bridge of Bab-el-Aonzar—typical in all respects, as are the eggs.

Re M.A. p. 297, the Yebala specimens do *not* confirm this suggestion.

Cinclus cinclus aquaticus Bechst. (Dipper.)

Coll. 1 ♂ with nest 4 eggs, 20.3; 1 ♂, 1 ♀ with their nest of 3 young, 31.3.

There was one pair of Dippers on the torrent above Quitsan, and one pair on the Xauen torrent—no more. In Beni-Aros the species was absent, but the streams there are not very suitable.

They breed early, as customary in Europe; the first eggs taken must have been laid about March 14: this nest was behind a cascade which entailed a cold bath to get it.

Both nest and eggs are typical.

Although through the interposition of (it seems) *cinclus* in North and Central Spain and *pyrenaicus* in the Pyrenees, this diagnosis of the Yebala Dippers presents another apparent anomaly in Dipper distribution, and I call our Yebala birds *aquaticus*, being unable, from very fair series, to see the difference between *minor* of North Africa and perhaps Sierra Nevada, and *aquaticus* of Germany, etc.

125. *Hirundo rustica* L. (Swallow.)

Swallows were with us all the time, i.e. from March 13 onwards, hosts of migrants and a small proportion of summer visitors.

At Quitsan in the evening of March 15, two swallows arrived and spent that and succeeding nights on the rim of a last year's nest in the guard-room of our Police Station, full, as usual, of Moors.

Of course, one supposes these two birds to have been a pair and last year's owners of the nest. The poetic Moors took it for granted.

¹ In the Witherby collection are a few good Gibraltar-breeding specimens from Surgeon Rear-Admiral Stenhouse, but more are wanted, even of midsummer birds from this locality.

I regret now, too late, that we did not pay attention to the request in H. and J., 125, for more breeding specimens from Marocco, but there is always a delicacy about the conversion of these little feathered "lares et penates" into specimens.

127. *Delichon urbica*. (House Martin.)

In our experience, only a migrant. We saw no nests, old or new, anywhere, even at Ceuta, where, however, we *did* see two birds so late as May 13; but they were in company with Swallows over the crowded football ground, most likely migrants, anyhow unobtainable.

The migration of the House Martin was of a more intermittent nature than that of the Swallow, e.g., although quite a few passed during the third week of March (and there were plenty at Madrid on March 9); a fortnight ensued without our seeing another; then they began to come through again, and during the first week of May were migrating in considerable numbers, and in company with swallows and hordes of swifts.

Favier's record of breeding has the ring of truth, and Irby appears to have accepted it; I think there is good reason to expect confirmation in due course, though very likely not as *house-nesters*, but as *cave-nesters* in the limestone crags, as in the Campo de Gibraltar.

128. *Riparia riparia riparia* (L.). (Sand Martin.)

I can only say of the Sand Martin that we are almost sure of having seen a few on passage on April 16.

130. *Riparia rupestris rupestris* (Scop.). (Crag Martin.)

Coll. 1 ♀, 20.3.

We frequently saw Crag Martins in March, but not again after April 1 on Mago. All these were certainly on migration. But I did not think J. Buhasem, with its comparative lack of crags and caves, a suitable *breeding* haunt, and as we never were among the limestone crags after the April 4, our experience must not be regarded as evidence against the Crag Martin breeding in Yebala.

All the limestone crags from Apes Hill to J. Mago exactly resemble those in Andalusia, in which the Crag Martin loves to breed, and I think a good re-examination in (say) June should be made before the species can be struck off the breeding list, even provisionally.

131. *Apus melba* L. (Alpine Swift.)

132. *Apus apus apus* (L.). (Black Swift.)

Coll. 1 ♀, 30.4.

133. *Apus murinus brehmorum* (Hart.). (Pallid Swift.)

Coll. 1 ♀, 9.4.

We saw no Swifts until we returned to Tetuan from Xauen, where there were none, so they must have arrived at Tetuan about the end of March.

We had ample opportunity of watching these Tetuan Swifts (in flight of course), for they were all over the town, and never saw one we could put down as other than *apus*; but our only specimen from Tetuan, a ♀ with ovary in winter

state, who flew into Major Fuentes' house on the stormy night of April 8-9, proved a *murinus*.

Our next Swift experience was in Beni-Aros, where daily from April 30 to May 6, at varied times of day, around and over the summits of the mountains there appeared vast concourses of Swifts, Alpine Swifts, Swallows, and House Martins. The majority were undoubtedly black Swifts, of which we shot three, then there were a few *white-bellied* swifts, some certainly *melba*, and others which looked no bigger than the *apus* (? an optical illusion—for what else could they be but *melba*, unfortunately these rarely came within shot); swallows numerous; and House Martins, some days many, other days few or none.

It was a wonderful spectacle; one day I watched it from 3.15 to 4.30 p.m. and left it still going on. Now and again the whole swarm would shift a mile or two, to over another summit; then, perhaps in ten minutes, back to Buhasem again, once more enveloping us in its ceaseless whirl of forms and swishing of wings.

That the members of this concourse were engaged in fly-catching was obvious, and also proved by the stomach-contents of our specimens, and first impressions suggested the phenomenon as an incident in migration passage, thus: a great hatch of flies had risen in the path of the migrants; first arrivals on the scene, being hungry, had stopped their journey to feed, more birds and yet more coming along in rear swelled the numbers, until the continued "banking-up" formed them into a vast multitude, keeping at the fly swarm wherever it shifted under the influence of the air-currents and the volition of its members.

But was it so? were the birds, all or any, on real "passage"? or had they merely collected from near and far, vulture fashion and by similar employment of their senses, to the feast?

Under, sometimes through, the swarm, bee-eaters and occasionally other swallows would pass, without joining in; these were certainly on migration flight—but then they were only a few representatives of regular "see-go-by-all-day-long" species, the Swifts were not.

In our specimens the sex organs were enlarging, but not nearly in full breeding condition; the birds were all very fat—facts inclined to favour the migration theory; on the other hand, at home one often finds parties of Swifts hawking flies over remote mountain and moor tops—during their nesting time.

Again, in Darfur near Jebel Marra we sometimes had exactly similar Swift swarms, composed of four or five different species: hatches of flying termites were there, the principal food (though not always), and we seldom had any real grounds for supposing these birds to be on passage. I have seen other such Swift-swarms on a smaller scale in other parts of the world, China, etc.

It is doubtless a cosmopolitan Swift *habit*. We can add no other information about the swifts in Yebala.

136. *Caprimulgus europaeus europaeus* L. (Nightjar.)

Coll. 1 ♀, 12.5.

The only Nightjar sp. we ever saw was the above specimen from the little cork wood at Benu, where she was obviously resting on migration. The Vaucher record as "plutôt hôte d'hiver" is surely an error.

138. *Merops apiaster* L. (Bee-eater.)

We only saw Bee-eaters on migration flight, owing no doubt to not having worked any likely breeding ground subsequent to their general arrival in the country, which was about the second week of May.

Directly the fine weather set in on April 29, parties of Bee-eaters passed overhead in their leisurely way—off and on all day long, and every day up to May 8, perhaps even later.

139. *Upupa epops* L. (Hoopoe.)

At Quitsan in March there were quite a few Hoopoes about—who seemed to be fresh arrivals—but there can be very few breeding birds in Yebala, surely? for after mid-April we never saw, or what will be still more significant to those who know the Hoopoe on its breeding ground, never *heard* one.

140. *Coracias garrulus garrulus* L. (Roller.)

Mirabile dictu! or so it seems to me, we never saw a single Roller anywhere.

141. *Alcedo atthis*. (Kingfisher.)

If the Kingfisher does breed in Yebala, the banks of the Rio Martin would be a first-rate place to look for its nest. We ourselves did scarcely any work there. In any case we saw the species nowhere.

*142. *Picus vaillanti* (Malh.). (Le Vaillant's Green Woodpecker.)

Coll. 4 ♂, 3 ♀, Beni-Aros.

Owing probably to lack of timber¹ near Quitsan, and the conifer forest of Mago being evidently an unsuitable one, we did not come across any woodpeckers until we reached Beni-Aros.

Here *vaillanti* was plentiful in the "big forest" and quite frequent in the groves as low down as they were large enough, about 1,700 ft.

The first one, shot on April 25, was a ♀, just about to lay her eggs, another on May 5 had laid half her clutch.

The common call of this species is extremely kestrel-like, and the alarm note very like the "chuck" of the Great Spotted Woodpecker, and I am almost sure that it "jars" like that species does (in China I have watched *guerini* jarring).

We saw a Green Woodpecker in the cork trees of the El Bijut "wooded jungle" behind Apes Hill, whence Irby records *vaillanti*.

*143. *Dryobates major mauretanus* (Brehm). (Greater Spotted Woodpecker.)

Coll. 2 ♂, 3 ♀, Beni-Aros.

Only found in the big forest on J. Buhasem, in numbers about equal to the preceding species, and breeding apparently about ten days later.

¹ But Irby "found this Green Woodpecker common near Tetuan," and the Greater Spotted "plentiful about Tetuan" (see H. and J., 143)—where, I cannot imagine, unless trees have been cut down since their time.

***145. *Cuculus canorus* L. (Cuckoo.)**

Our only records of the cuckoo are as follows: First *seen* crossing the Vega of Tetuan April 9, then in the (lower) Buhasem forest seen on April 18, first heard May 2, thenceforth daily seen and heard up to the day of our departure May 8. All single birds.

146. *Clamator glandarius* (L.). (Great Spotted Cuckoo.)

Not seen.

148. *Otus scops scops* (L.). (Scops Owl.)

Coll. 1 ♂, 3.5.

Piping, by night and twilight, began with us on May 3, and doubtless indicated more or less nearly the arrival of the Scops Owls in their summer quarters in Beni-Aros.

Judging from the sex organs of our specimen, breeding would not have been much before the end of May.

149. *Athene noctua* (? race). (Little Owl.)

Coll. 3 ♂, Tazarut, 25.4–3.5.

It was not until April 25 that we saw Little Owls, after which they were to be met with all round our camp on the pasture slopes, generally perched on the boulders, in twos, presumably pairs, and noisy in the early morning. Probable breeding date about the same as that of the Scops Owl.

Our three specimens, all quite alike, and therefore presumably typical of the Beni-Aros aggregate, are a surprise and best left unnamed (racially) until more material from North and Central Morocco is available. They are nothing like *sandy*-brown *glauca*, and nearest of all in size and in colour above to *earthy*-brown *vidalii*, but have *earthy*-brown stripe marks below instead of the *blackish*-brown characteristic of *vidalii*. The North Moroccan bird is supposed to be *glauca*.

It is not at all a case of the Beni-Aros birds being intermediate between *vidalii* and *glauca* (as the map might suggest).

154. *Strix aluco mauretanica* (With.). (Wood Owl.)

Coll. 1 ♂, 18.3.

The Wood Owl must be moderately plentiful in Yebala, and not confined to woodlands proper, since, besides our specimen from the little half-acre grove at Quitsan, we heard one at Xauen, where it could not have had more woodland than that furnished by the olive-trees of the orchards. We heard others o' nights in the Buhasem forest. The note of *mauretanica*, though typical wood owl, is extremely musical and perhaps characteristic of the race?

No records of other Owls.

163. *Falco naumanni naumanni* Fleisch. (Lesser Kestrel.)

164. *Falco tinnunculus tinnunculus* L. (Kestrel.)

Kestrels were with us throughout our stay in Morocco, but I think, with Irby, that except at close range—so that the plain or spotted mantle can be seen

—field diagnosis of these two species in localities where both occur, are apt to be untrustworthy, so only record the following certainties :—*Lesser Kestrel* : two, apparently some of the earliest migrants of the year, seen on April 9 ; *Kestrel* : fairly common during our whole visit wherever we went—individuals probably resident.

Never a sign of any kestrel nesting in old towers and town walls did we see in Yebala.

Falco sp.

Except for the Kestrels above, and occasional glimpses of *small* falcons like hobbies in the distance, we never saw any other *Falco* sp.

Re H. and J., 160. Abel Chapman and I found numbers of hobbies (one party of about twenty-five) migrating through the Coto Doñana on May 18, 19, 1910. This, though a three or four weeks later date, confirms Irby's record of migration "near Gibraltar." I think Favier's record for North Morocco will probably prove to be correct (for *subbuteo*).

Aquila rapax belisarius (Lev.). (Tawny Eagle.)

A Tawny Eagle came within 50 yards of me on April 29 in Beni-Aros, and May 3 we identified a pair over the Buhasem forest, so very likely they were breeding there.

Hieraetus sp. ?

Both at Xauen and in Beni-Aros we saw occasional eagles, which must have been of this genus ; we thought we saw Bonelli's Eagle at Xauen, and Booted in Beni-Aros, but they were always alone and at unknown long-range—so that their size was uncertain.

*170. *Buteo ferox cirtensis* (Lev.). (Rufous Buzzard.)

A pair frequented the vicinity of Xauen and would breed there, for we saw them *in coitu* on March 31. Two pairs were with us in Beni-Aros ; one of them made a nest in the main fork—40 ft. high—of one of the largest oak-trees in the "big forest," and on May 7 were found at it, engaged in battle with a pair of Ravens, who seemed to be getting the better of it ; but not having a climbing apparatus, I could not get up to the nest to see whether it was eggs or nest (or both !) the Ravens wanted.

On May 15 a *ferox* was hanging about the Benu cork-wood, but I could find no nest there. This bird, an adult, was in extreme "light-phase" plumage, and I am now convinced that the Middle-Atlas birds of my note on M.A., p. 299, were similar examples of the Buzzard. Examination of specimens suggests that this "light phase" is brought about through a general lack of the normal red and brown pigments, and that in extreme cases the colour and markings of the tail and under-parts are obliterated or become "obsolete" to the extent of making the bird *look*, when seen in flight from below, like a sort of "small, square-tailed *Neophron*," i.e. white with black wing-tips. As bearing on the *age* of these birds, I will only remark that they are certainly not birds of the year, and that the phase is not an uncommon one in Morocco.

171. *Buteo buteo buteo* (L.). (Common Buzzard.)

We have the following two reliable records of the Common Buzzard ; in both cases seen at short range : at Quitsan March 19, at El Bijut (two miles S.W. of Apes Hill) May 11. The latter was very likely breeding in one of the cork trees of the El Bijut "wooded jungle."

172. *Circus aeruginosus* (L.). (Marsh Harrier.)

Our only record of the Marsh Harrier is of a single old ♂, quartering the lower eastern slopes of J. Buhasem on April 16. This bird was evidently on migration and probably of typical Race.

175. *Circus pygargus* (L.). (Montagu's Harrier.)

A young ♂ Montagu's Harrier, evidently on migration, was shot by a Spanish Military Officer in the O. Lau valley, below Xauen, during the stormy April 2. Señor Quiros skinned this bird, so we were able to examine the sex organs, which were in winter state.

177. *Accipiter nisus* (L.). (Sparrow-hawk.)

Single sparrow-hawks (? race) frequently passed us in rapid flight about Quitsan and Xauen, and from memory (though I cannot find the record in my notes) also in Beni-Aros. The forests of the last place are eminently suited to the breeding requirements of the species, but we found no Sparrow-hawks' nests there, old or new.

*179. *Milvus milvus* (L.). (Red Kite.)

In Beni-Hozmar we constantly saw the Red Kite—a pair seen on April 16 appeared to be nesting in a grove on the upper western slopes of the range. At Tazarut, during our stay, one pair was breeding in a big grove at 1,900 ft., containing some splendid old cork and oak trees, and there seemed to be another pair nesting in the lower forest about a mile away.

We have no evidence that the species is not resident in Yebala.

Milvus migrans migrans (Bodd.). (Black Kite.)

With us, Black Kites, though present wherever we went, were rather scarce. They were about the country when we arrived there, and the actions of a bird frequently seen at Tazarut suggested breeding in the vicinity.

183. *Circaetus gallicus* (Gm.). (Snake Eagle.)

In Beni-Aros we saw a single Snake Eagle several times between April 17 and May 8. Most probably this bird was nesting in the forest.

We have no other record of the species.

Pandion haliaetus haliaetus (L.). (Osprey.)

Judging by the actions of a single bird at Isla de Perejil on May 14, there was an Osprey's nest in its precipitous cliffs with young or a sitting bird.

Ospreys have been known to breed on this island for years past.

185. *Gypaëtus barbatus barbatus* (L.). (Bearded Vulture.)

All we can say of the Lammergeier in Yebala is that we were told, and the evidence appeared circumstantially true, and the place with its fine, vulture-free crags likely enough, that in the autumn of 1922 a party of three *Gypaëtus* came to the crags over Xauen and stayed about the place until one was shot by a Spanish officer, on which the other two "shook off the dust" and departed. At any rate, none were there during our visit, or anywhere else to our knowledge. It was further related that the above specimen was skinned, and deposited somewhere in Tetuan, but we failed to trace it there.

186. *Neophron percnopterus percnopterus* (L.). (Egyptian Vulture.)

Our only records are: one just outside Tetuan on April 16 (positively our first sight of any Vulture in Morocco!) and another single bird soaring over Tazerut on May 1.

187. *Gyps fulvus fulvus* (Habl.). (Griffon Vulture.)

About Apes Hill in May, where Irby recorded "a few pairs," we saw numbers, otherwise the following rather curious incident constitutes our sole record of the species. About 3 p.m. on April 29, weather fine, with moderate N.E. breeze, four Griffons sailed up from the south, about 300 ft. up, circling as they travelled steadily northwards, i.e. more or less against the wind. In perhaps ten minutes they were lost to view (field-glass) in the distance, and up sailed another four, and went through the same performance.

In a vulture country like, say, Andalusia, I should not have even noted the incident, but what did it indicate in this vultureless country? These eight birds were evidently travelling with a purpose, incidentally looking out for food (which is probably never absent from their thoughts and actions, save when gorged or in sleep?) at the time of the year when breeding Griffons are busy with their nurseries; they were not (*could* not in any case have been) birds of the year, though they may have been first year and non-breeding birds. Storks and some other big birds constantly circle on passage flight, Vultures do not hunt in this manner for food; a shifting of quarters of some sort was clearly the purpose of these birds, but whence and whither is rather a puzzle?

ORDER ACCIPITRES. (Retrospect.)

Some of our records of Accipitres are scarcely worth having, but I have put them *all* down, if only to show how extraordinarily poor in birds of prey, especially big birds of prey like Vultures and Eagles, we found Western and Central Yebala. Most of the inhabited country is pastoral, not agricultural; splendid wild crags of every sort are within easy hail (even of Beni-Aros—for a Vulture or an Eagle) and the natives do not go in for killing birds of prey.

In similar country, only just across the Straits of Gibraltar, the whole ORDER abounds. We may have been singularly unfortunate (indeed, we *were*, if the records are not in some cases "optimistic"?), but if one looks out for birds, as we did to the best of our ability, Eagles and Vultures are not trifles that escape observation easily. What can be the cause of the scarcity?

189. *Ciconia ciconia ciconia* (L.). (White Stork.)

Storks, we were credibly informed, first arrived towards the end of March, but we saw none ourselves until early in April.

One pair remained to breed at Xauen and another at Tazarut; at Tetuan

and Ceuta the species was very little in evidence, but Munn saw nests near Tetuan in May.

198. *Bubulcus ibis ibis* (L.). (Buff-backed Heron.)

Buff-backed Herons arrived in the country before we did, and until mid-April, when we went up country, were plentiful in the Vega of Tetuan. On our return, May 8, the Vega only contained an odd bird or two, so far as we could see, but there were likely enough more towards the mouth of the Rio Martin, where Munn saw "troops" in early May, perhaps nesting there.

ORDERS GRESSORES, PHOENICOPTERI, ANSERES, PYGOPODES.

With the exception of the foregoing records (189, 198), we have no notes of value on any other members of these Orders. Our ground and time of year were both unsuitable.

*232. *Phalacrocorax graculus desmarestii* (Payr.). (Shag.)

Coll. 1 ♀, 14.5.

Numbers of Shags were breeding in the sea-cliffs of the mainland under Apes Hill and those of Isla de Perejil on May 14. All stages of plumage were represented among these birds, from the quite light-breasted immature to the "all-black" adult. Our specimen was one of the last, and would have laid her first (of two) eggs in two or three days time.

ORDER TUBINARES.

Our examination of the sea-coast from Ceuta to Isla de Perejil on May 14 produced no signs of any Petrel. I have seen numbers of Stormy Petrels in the Straits in August; Irby suggests their breeding. In May any Petrels that might have been in the neighbourhood would probably be in their "nest-burrows" during the daytime, but from my Mediterranean acquaintanceship with *kuhlii*, *yelkowan*, and *pelagicus*, after hunting the Isla de Perejil, I think no Petrels were breeding on it. It looks the most promising place for breeding Petrels along that part of the coast; nevertheless *kuhlii* and perhaps the Stormy Petrel may yet be found to breed in the Straits.

246. *Columba livia livia* Gm. (Rock Pigeon.)

Coll. 1 ♂, 14.5.

Numbers of Rock Pigeons were breeding or about to breed in the sea cliffs under Apes Hill and those of Isla de Perejil on May 14.

247. *Columba oenas oenas* L. (Stock Pigeon.)

Coll. 2 ♂, 5.5.

Stock Doves were right up in the Pinsapo forest on J. Mago at 6,500 ft. on May 1, and they abounded in the upper part of the "big forest" on J. Buhasem; resting in the trees at midday, and feeding morning and evening in the lowlands, just like they do in the Middle Atlas. Also, as there, the Yebala birds evidently breed late; our two specimens, shot out of a big flock resting in the forest at mid-day May 5, had sex organs scarcely out of winter state.

248. *Columba palumbus palumbus* L. (Wood Pigeon.)

Coll. ♀, 23.4.

Orchards and groves are sufficient woodland in Yebala for the Wood Pigeon. We found the species wherever we went, and very abundant in Beni-Aros, where

their habits are much like those of the Stock Pigeon—except that they probably breed a little earlier, and occupy lower altitudes. The note is precisely like that of our British bird.

Our only specimen is not a deeply coloured bird, and although this does not of course put *excelsa* out of court for Yebala, I call it *palumbus* because I do not think the proportion of deeper-coloured individuals (only some 50 per cent. so far as I can see) from North Africa great enough to warrant separation.

249. *Streptopelia turtur arenicola* (Hart.). (Turtle Dove.)

Turtle Doves began to arrive about April 29, and numbers were still on migration on May 13.

I think we left Marocco too early to make any notes on breeding.

276. *Tringa ochropus* L. (Green Sandpiper.)

A Green Sandpiper at the Xauen torrent on March 27 was, of course, on migration.

289. *Capella gallinago gallinago* (L.). (Common Snipe.)

The migrant Snipe were coming through in April (April 9, Vega of Tetuan, plentiful).

ORDER LIMICOLAE. (Retrospect.)

Excepting the above two notes (276, 289) we can add nothing to the records concerning Waders. Those members of the Order already in the North Marocco list are nearly all winter visitors and migrants in *Western* Yebala, and few are likely to occur except as stragglers in the east and central parts we visited in spring.

Larus argentatus michahellesii Bruch. (Yellow-legged Herring Gull.)

Coll. 3 ♂, 1 ♀, 14.5.

This, the *Mediterranean* race of the Herring Gull (in the nomenclature of which I follow Dr. Hartert¹), according to our experience, seems to be the only sea-coast *breeding* gull in the Straits of Gibraltar. On May 14 we visited two colonies of these gulls only 1½ miles apart. One, of about 50 *pairs*, had young and eggs in the mainland sea cliffs under Apes Hill, and the other at Isla de Perejil of some six hundred birds, who, although clearly *going* to breed there (and gulls' eggs are known to be collected there annually), had not even started to make their nests; in fact, by sex organs of our three specimens, this colony would not be laying until well into June. All birds at these two colonies were in fully adult plumage, and all of identical kind; the few immature plumaged birds seen kept out at sea in the offing. What is the reason for this curious "separate identity"? do the members of each colony come from different winter quarters, or what? Four or five weeks difference in breeding date is such a big one in an aggregate of birds of the same kind in the same locality. It is not easy to see how the question could be explored except by "ringing."

¹ *Vög. Pal. Fauna Nachtrag* i. p. 86.

Larus fuscus L. (Lesser Black-backed Gull.)

Probably the majority of the dark-backed gulls we saw when crossing the Straits in March were *L. fuscus affinis*, the British breeding form with the slate-grey mantle, and a few *fuscus*, the Scandinavian breeding form, with the slate-black mantle; but I think it is now clear that no form of Lesser Black-backed Gull *breeds* in the Straits.

330. Crex crex (L.) (Corncrake.)

On April 14 a local "cazador" shot a Corncrake and some Quails in the Vega of Tetuan.

337. Alectoris barbara barbara (Bonn.) (Barbary Partridge.)

Coll. 1 ♂, 19.4, testes large.

Quite plentiful everywhere: stony, scrub-clad hill-sides are their favourite ground. In twos, presumably pairs, during our whole visit, but we have no breeding data to give.

339. Coturnix coturnix coturnix (L.) (Quail.)

As early as March 19 we heard the Quail calling, but although the species was migrating in numbers all through April and up to the day we left Morocco (May 17, market at Ceuta well-stocked), we never but once heard the *call* again.

I am under the impression that the birds found in winter in the Mediterranean are mostly or all resident individuals, and breed early, but are of course in numbers infinitesimal compared to the migrants (plus whatever Mediterranean summer visitors = "late" breeders there may be as well).

PART IV.—SUMMARY AND CONCLUSIONS.**A. MAINLY GEOGRAPHICAL.**

The Map (Plate I) has been compiled mainly from two military maps, one Spanish, of Yebala, scale 1:150,000, February 1922, the other French, of (all) Morocco, scale 1:1,000,000, 1921. These are the latest published, and a great advance on all the older ones of both Protectorates.

In most of our atlases Morocco never appears but to tiny scale, and since mention is made in this paper of certain relationships between the Spanish zone and other parts of Morocco, I think this compilation will be of more use to the reader than a big-scale one of Yebala only.

There is now a considerable literature about Morocco, out of which those who would study such known facts as are published about its physical qualities, as well as some of its modern political and social conditions, will do well to read, if no others:

For all Morocco: *Le Maroc physique*, Louis Gentil, 1912; and *Les confins Algéro-Marocaines*, Augustin Bernard, 1911.

For Spanish Morocco: the paper in *Geographical Journals*, May and June, 1920, by H.E. the Spanish Ambassador, Señor Merry del Val.

And for Yebala: *Yebala y el bajo Lucus*, an excellent little work published by the "Real Sociedad Española de Historia Naturel," 1914.

But Spanish Moroccan affairs have undergone much change during the last three years ; and since we have no account of the country, except of the Tangier-Tetuan neighbourhood, in our English literature treating of North Morocco natural history, as well as to explain the geographical nomenclature of this paper I think the following brief summary will be useful.

Spanish Morocco is divided into two administrative Provinces, the Western called "Yebala" ¹ and the Eastern called "Rif."

The whole Protectorate, more or less, coincides with the well-defined physical area called "North Morocco, which is therefore synonymous with "Spanish Morocco," and its two provincial divisions are well called respectively "N.W." and "N.E. Morocco," hence the title of this paper.

In the Map (Plate I), a distinction is shown between the political and physical ² divisions of Spanish Morocco. This, in itself, is nothing very remarkable, but the nomenclature presents a difficulty ; for instance, not to call the high mountain-chain, which *par excellence* is the geographical feature of North Morocco, "the Rif," would be to ignore the name by which it has been known for centuries past, and yet without explanation that name would convey no precise meaning.

The fact is, the term "the Rif" = "Riff" = "El Rif" (Sp.) = "Er Rif" (Moor.) has had, and still has, many different interpretations. Thus :

(a) In standard works of reference "*the Rif*" is commonly defined as the territory inhabited by the Riffians (=Rifi) . . . indicating more or less vaguely all the country between Algeria and Ceuta, or even all North Morocco.

(b) The present Spanish Province of "Rif" extends from Oued Moulouya only so far westward as Oued Uaringa,³ where it marches with "Yebala" Province—thus dividing our great physical unit into two indivisible parts.

(c) "*The Rif*" is also in frequent use as a convenient abbreviation for the Rif Mountains or Rif Chain, which again has no universally accepted conception ; for instance, since the high Rif chain, the mountains of Beni-Hassan, Beni-Hozmar, Haus, and Anjera are all part of the same continuous earth-crinkle, orographically speaking "the Rif" chain ends at the Straits of Gibraltar in Apes Hill.⁴ Hartert and Jourdain⁵ and others take the Beni-Hozmar Mountains as the end of their "Rif." It is only fair to say that there is no confusion here, because these authors, like most other scientists, take care to make their meaning clear.

(d) It is in frequent use in connection with anything concerning the Spanish "Rif Province." Thus, "Spain and the Rif" will often head a newspaper paragraph about little more than affairs at (say) Melilla, which is not of course

¹ "Jebala" = "Yebala" = "The mountain people," from "Jebel" = "mountain," or plural of "Yebli" = "an inhabitant of the mountains" (Cabrera).

² I use the word "physical" throughout in its somewhat restricted sense as commonly applied to natural history ; perhaps the word "natural" would be better, but I think my meaning will be clear from the context.

³ That is, the coastal end of the boundary-line, which thence runs first southerly and then in a general way to the south-eastward (following supposed tribal boundaries or physical features ?) until it meets the French zone to the northward of Taza.

How or why this boundary originated I do not know, but it seems to have done so about the middle of the nineteenth century ; and that it is still the official boundary between the two Spanish Provinces is beyond all question—see Merry del Val, pp. 341, 342, confirmed to date by Cabrera.

⁴ See Gentil, pp. 3, 86, 163, etc. ; this view is in general acceptance.

⁵ See H. & J., 58, 124, etc.

occupied by the Rifi. But here the use of the term is justified by the theme, which will be sure to concern the Rifi, directly or indirectly.

(e) "The Rif," as the country inhabited collectively by the Rifi tribes to-day, is most commonly considered, even in Morocco itself, as all the unconquered territory between J. Mago and the submitted eastern part of the "Rif Province" (coincident with the physical division I have called *the high Rif*). Outside of this, both to eastward and westward, the inhabitants are not now classed as "Rifi" but with their territories according to the various tribal names; thus, the Beni-Aros tribe inhabits the Beni-Aros territory; Beni-Bu-Yahi, the Beni-Bu-Yahi territory; and so on. This "popular" conception of "the Rif" is endorsed (in part) by Señor Merry del Val,¹ who quotes Xauen as "isolated between the savage Rif country to the east . . ." and the "tribe of Beni Said [on the south side of the lower Oued Lau], likewise bordering on the Rif . . .," and it also appears in other recent literature.

(f) Within the "Rif Province" itself, the political as well as the physical distinction between its eastern, i.e. Oued Moulouya to O. Kert portion (comprising the tribal territories of Beni-Bu-Yahi, Metalza, and others; coincident with the physical division I have called *the low Rif*), and the remaining western part, is remarked on by both Señor Merry del Val² and M. Bernard³; the latter, indeed, evidently, like me, in search of a name, calls the whole territory after Leo Africanus, the "Garet," but nowadays this name is applied only to a small part of it, a sterile plain to the southward and south-eastward of Melilla.

There are perhaps other definitions of "the Rif," but enough has been said, I think, to show that the way out of the nomenclatorial maze is not so easy when physical territories come under discussion.

Assuming that at least *common parlance*⁴ will always require the "Rif territory" to be properly that inhabited by the Rifi or Rif tribes, and *vice versa*, may it not be said that all this confusion arises from the fact that the Rifi have always been, and still are an unknown quantity?

Who, for instance, does Abd-el-Krim lead to-day? Does his influence extend over all "the high Rif" territory, or only as far east as the O. Uaringa, or what? To learn that Abd-el-Krim leads "all the Rif tribes" gets us no nearer to our point.⁵

It seems to me that the term "Riffians" or "Rifi," having started life in early times as embracing, in a general way, *all* the tribes of North Morocco, has, in recent years, through Europe acquiring more knowledge and ground there, become less nebulous; and that *now*, all the peoples of North Morocco are classed according to their tribal names except those inhabiting "the high Rif" territory. May we not assume that when these folk, too, have been brought to order, or at least to unaggressive recognition of the Sultan (through Spain, their nominal ruler), they, too, will emerge into clear definition under their tribal names? which, by the way, are already more or less known.

Who will then be the "Rifi," and what "the Rif"?

¹ Pp. 339, 412, *op. cit.*

² Pp. 333, 348, *op. cit.*

³ P. 8, *op. cit.*

⁴ In this criticism I exclude nomenclature required by political administrations, and certain particular departments of natural science like ethnology, orography, etc. Presumably "common" parlance should take its lead, when possible, from the first, but must generally be independent of the others.

⁵ See *Times*, September 15, 1923.

I suppose the right answer is to "wait and see"; but for the present, knowing what we do, and on the ground that all parlance, whether political, common, or scientific, is simplified by being as much in one line as possible, I propose the following names for the three well-marked *physical* divisions of North Morocco: For the territory containing the high chain, i.e. summits of over 2,000 m., *the high Rif*, that to the eastward of it, *the low Rif*, and to the westward, *Yebala*.

To attempt definition of the base of "the high Rif" is not possible yet, nor is it here required; it is supposed, towards the sea-coast, to be somewhere near O. Kert; to the eastward and south-eastward it *can* only be imagined as, vaguely, "the end of the massif whose high peaks are visible from the offing," and although the O. Lau, encircling the base of Mago, seems the natural western boundary, I shall not attempt to disturb Xauen's political Yebala-dom, or that of any place we visited; we only just peeped into "the high Rif" from its western boundary—a good broad line on the map.

Now to briefly state the characters of these three physical divisions.

"The high Rif."

Is very roughly about eighty miles long (E.-W.), by twenty to thirty broad, 3,000 square miles.

Although no one has ever entered it to do any surveying work, owing to its shape and comparatively small size, the whole territory being visible *en silhouette* on a clear day to an observer to the northward or southward of it, it cannot be called quite a geographical *terra incognita*. In the French map 1:1,000,000 of 1921 the provisional representation of "the high Rif"—presumably derived from distant observation and (Spanish) air reconnaissances?—differs considerably from earlier attempts (most of which are manifestly quite inadequate) and fits in much better than any yet published with the few facts that can be regarded as more or less known about its geography, which seem to be, broadly, these:

1. It is dominated from end to end by the high Rif chain with its series of summits considerably higher than anything else in North Morocco.

2. Its narrowness and the accurate knowledge of the hydrography of its border lands prove that the high Rif must be a continuous chain.

3. J. Mago (7,200 ft.) at its extreme western end is known and surveyed; we found it to be composed of secondary limestone in agreement with M. Gentil's "Carte géologique provisoire, 1920," and crowned with a considerable forest of Pinsapos and Cedars.

4. We can also add the following fragment:

When on Mago itself, owing to our not being allowed to go beyond its western face, we could never see what lay beyond it to the eastward; but, from the top of J. Buhasem one fairly clear day (May 5) we could see very well the high Rif chain stretching away beyond Mago.

There seemed to be three distinct summits, No. 1 about five, No. 2 about ten, and No. 3 about twenty-five miles beyond Mago. Nos. 1 and 2 were clearly crowned with conifer forest, No. 3, unless the distance deceived us, was so too (see Map, Plate I, at "1," "2," "3").

Snow, probably, like that on Mago, recently fallen, was lying on all, but whereas Mago was only, so to speak, "heavily patched" down to about 6,300 ft.,

"Nos. 1 and 3" were gleaming stretches of pure white, an effect, we thought, due to perspective rather than to greatly superior altitude or high plateaux free of timber.

Bad atmospheric visibility prevented our seeing beyond "No. 3."

In our Map the position and contours of the mountains to the eastward of No. 3, and also the tracts of "known" forest there, are as shown on the French map.

I think it will turn out that the highest peak of the chain will be near to 7,500 ft., not exceeding 8,000 ft.; most maps show 2,500 m. (8,200 ft.).

No two maps are alike in *nomenclature* of the principal peaks, so I have attempted none.

"The low Rif."

Is a country of comparatively low hills, plains and plateaux, some 1,200 square miles in extent, rising gradually to the south-eastward to merge insensibly into the steppes of Western Algeria across the O. Moulouya. Sandy, stony, much of it arid, the soil is only cultivated in the lower and moister parts. Throughout, pasture is the principal domestic feature; these alternate with great dreary stretches of esparto grass and semi-desert wastes.

The vegetation inclines to "xerophytism," and save for the few olives and other trees of cultivation the whole territory is practically treeless. "The low Rif," in fact, lies in a gap, between "the high Rif" and the Algerian Tell, through which gap the Sahara tries to escape, as it were, into the Mediterranean Sea. The desert influence over this territory is well shown in M. Bernard's "Carte pluviométrique," which gives its mean annual rainfall as about 12 inches, against Yebala's 32 inches. A type of country obviously quite unlike Yebala or anything we know of, or may expect in, "the high Rif."

Señor Cabrera has done a good deal of natural history work in "The low Rif," and has found the mammalian fauna in general very like that of West Algeria,¹ very different to that of Yebala.

There are no definite ornithological records, but we may certainly expect interesting larks and chats, and indeed any information from this border-zone, bearing on the separation between Moroccan and Algerian fauna and flora, cannot fail to be of value.

"Yebala."

Area about 3,500 square miles. As its name implies, Yebala is a mountainous territory, but the heights are rarely more than "moderate"; the low land is all coastal and nearly all on the Atlantic side. The Spanish 1:150,000 map of 1922 shows accurately all topographic details, and revises positions and most of the heights shown on older maps. In particular Jebel Kelti, the "Mount Anna" of most maps, which, viewed from the northwards, is very conspicuous by reason of its isolation and 750 ft. of superiority to any others in the territory, is reduced from 7,200 to 6,250 ft.²

Geologically, the territory is varied, but the outstanding feature is simple enough; all the eastern mountains, i.e. the chain Beni-Hassan, Beni-Hozmar, Sierras de Haus, and Bullones (the orographic extension of the high Rif chain)

¹ Some characteristic mammals are: *Scirtopoda orientalis mauritanica*, *Poecilictis vaillanti*, *Lepus schlumbergeri pediscus*, *Elephantulus rozeti rozeti*. (Cabrera.)

² J. Mago, fourteen miles south of J. Kelti, is 7,200 ft., a suggestive coincidence?

of Primary and Secondary, all the remainder of later, formations. This produces corresponding important differences in relief and vegetation, which, together with other remarks on the physical geography of most of the eastern and central parts of the territory, are recorded in Part II.

Of the parts of Yebala not visited by us, the north is in general like the north-eastern without the Sierra, but the western, i.e. the Atlantic coastal, part has considerable individuality apart from the rest of the whole Province. Thus, it is lower and flatter, much sand-dune and palmetto-scrub country in the northern half, swamp and jungle with scattered woodland in the Southern; its ocean frontage gives it a more humid atmosphere, which reacts on the character of its vegetation, and so forth. This is all well recorded in *Yebala y el bajo Lucus*; in fact, the physical geography of Yebala is now rather well known.

The question of "trees" apart from those of cultivation (in orchards, plantations, gardens, at the towns and villages) is so specially pertinent to the Ornithological record for North Morocco, that I have taken some pains to inquire what there is in the way of "trees" in those parts not included in our recent itinerary. Cabrera, who has considerable personal knowledge of most of it, has given me the benefit of his experience, and putting this with what the literature records on the subject the facts seem to be as follows:

Yebala has no "forests" or even "woods" worthy of the names (in the English sense), other than those in its central parts, i.e. Beni-Aros, Sumata,¹ and just where the high Rif touches it at J. Mago.

Elsewhere² there are:

Firstly, occasional "wooded jungles" (jungles with a sprinkling of small to medium-sized trees, of cork, acebuche, and ilex), as at El Bijut³ and Charf la Kab,⁴ which are about the largest of their kind.

Secondly, a fair number of sacred "groves"⁵—frequently big, old trees, of cork, acebuche, ilex, or arar, according to station; often only four or five trees, seldom covering more ground than half-an-acre.

These "groves" are scattered all over the country, more or less attached to the villages; a big village may have several "groves" within its hail, a small village only one, or even nothing more than a single patriarchal tree, and so on.

Thirdly, the little 30 acre cork-wood at Benzu,⁶ which is scarcely more than a glorified "grove," and in its isolation unique.

Finally, more important than any of the foregoing, nearly approaching the dignity of "woods" but better described here as "woodments," are the "patches" of big, old cork and acebuche trees, with tamarisks, jungle, and swamp, scattered over the Khabyla of Es-Sahel, from near Larache for some eight miles to the northward. These "woodments" are collectively called the "Gaba de Es-Sahel"⁷ and are, in whole or part, "les forêts de Boucharen" of M. Vaucher.

¹ As described pp. 30, 31.

² Especially see *Yebala y el bajo Lucus* and Irby, *Orn. Str. Gib.*, 1895, pp. 8, 11, 13.

³ See p. 35.

⁴ On some maps "Xarf," more correctly "Cherf el Aa Kab" = "the Rock of the fox" (Cabrera).

⁵ As described at Quitsan, p. 55, and about Tazarut, p. 63.

⁶ See p. 36.

⁷ I quote Cabrera (in *epistola*).

⁸ "Gaba" = woods. The nomenclature is varied. The wooded patches, some of which are mere "groves," are sufficiently separated to be more often called by individual names. Another collective name which appears on a Spanish map is "Bosque de Larache." "Boucharen" seems

Of course, as well illustrated in the Canadian lumberer's "what! only this little shrubbery!" when introduced to one of our best English woods, "forests" and "woods" are only comparative and inexact terms, and although M. Vaucher alludes to "les vastes forêts de Boucharen" and "les forêts de Charf la Kab et Boucharen," the idea of either of these meriting such distinction in a terminology which calls Beni-Aros "forested" is out of the question.

Neither must Boucharen's ornithological record be allowed to hold weight as evidence to the contrary. That it has recently produced nests and eggs of both Spotted and Green Woodpeckers, even of eagles like *adalberti* and Bonelli's and perhaps Booted (which the "big forest" of Beni-Aros has so far failed to do), is suggestive of spacious forests very different from the "woodments" of Es-Sahel, but they certainly do not exist.

That the patches of big, old trees represent, in the woods of Señor Merry del Val, "the remains of once great forests," is a fact in general acceptance, and although there is no suggestion of such a state within the period covered by modern history (and certainly not of Moroccan ornithological history), we probably have here merely an illustration of the way in which some kinds of birds will cling to the breeding haunts of their ancestors, despite their spoliation at the hand of man.

I have been unable to find out whether any material alteration in the tree-growth of Yebala has taken place during the past hundred years, the period covering the whole of our Ornithological record.

Unfortunately, the latter provides no data as to "change," and none can be deduced inferentially from it, as the localities of so many important woodland species are unknown—see for instance H. and J., 143, on the subject.

Irby's record of what he saw himself in Morocco is sure to be "sterling," and judging from it and a few other stray facts it seems that the (lack of) wild-tree growth must have been very much the same fifty years ago as it is to-day, and the plantations at Tangier itself considerably increased.

Besides its Gaba, the swamps of this Atlantic coastal part of Yebala have already been proved to hold many species of birds which do not breed or are even likely to be found in other parts of the Province, and there is certainly a great deal more we want to know about its natural history.

With regard to its climate, the account in Part II of our March and April weather will not have given the reader a very *couleur de rose* impression of Yebala spring weather, but, as a matter of fact, in normal years it is really quite pleasant. Details, from accurate meteorologic records and other observations, are given in *Yebala y el bajo Lucus*; the mean average annual rainfall at Tangier is about: spring 11, summer 1, autumn 7, winter 13 inches. Most of the "spring" rain falls in March and early April; after mid-April at the latest delightful "Mediterranean" spring weather may be expected with occasional showers, until summer sets in.

Spring 1923 was abnormally cold and wet all over South-Western Europe, and Morocco was no exception. We only had four quite fine days in all April. Our being among the mountains gave us a worse time, both in duration and

to be very rarely used; it appears on none of the Spanish or French maps that I have seen, and it was unknown to Cabrera; in fact, I have only been able to identify it through M. Vaucher's "près de Larache" and Señor Merry del Val's "... Gaba or woods of Es-Sahel, *Bujaren*, and *Laraiche*" (*op. cit.*, p. 337).

quantity of rain, than had we been in the lowlands all the time, but the storms were of cyclonic type and therefore general throughout the country.

Beni-Aros probably has a much heavier annual rainfall than Tangier or Tetuan. Constantly, during those nine days deluge of April 20-28 (when I verily believe some 15 inches fell on us) looking out from our shower-bath at Tazarut, we could see the sun shining over the valley 1,000 ft. below us, and blue sky to the westward. It was evident that the main body of nimbus cloud was coming in from the Atlantic at about 4,000 ft. and higher levels, thus passing clear over the Sumata Mountains (3,600 ft.) and not condensing into rain until it struck the upper 2,000 ft. of the Alam-Buhasem-Sugna Range. Most likely this local climatic condition is a normal one, and an important influence in the growth, if not the existence, of the Beni-Aros forest.

B. BIRDS.

The ornithological results of our field-work and collections have been given in detail in Part II.

They are small, and rather disappointing, for we found the bird-life less in quantity and variety than we had hoped, indeed expected to, from the records, and also from the look of the country when we got there.

The following is a brief analysis of them:

1. Additions to knowledge of the geography of North Morocco in relation to its bird-life (detailed in Parts I and II).

2. New forms: None. Only in the case of *Athene noctua* (149) is there doubt as to identity with some known form.

3. New names: None.

4. Names cancelled:

59. *Sitta europaea atlas* Lynes (= *S. e. hispaniensis* With.).

38. *Galerida theklæe berengueri* Cabrera (= *G. t. erlangeri* Hart.).

38a. *Galerida theklæe aguirrei* Cabrera (= *G. t. ruficolor* Whit.).

In the North Moroccan "List" in kind.

5. Additions:

59. *Sitta europaea hispaniensis* With. (Nuthatch), as *Resident*.

62. *Parus ater atlas* Meade-Waldo (Coal Tit), as *Resident*.

63. *Regulus ignicapillus ignicapillus* (Temm.) (Firecrest), as *Resident*.

70. *Muscicapa hypoleuca speculigera* Bp. (Pied Flycatcher [Southern]), as *summer visitor*.

57a. *Certhia brachydactyla brachydactyla* Brehm. (Treecreeper), as *resident*.

6. Definite confirmation:

7. *Pyrrhocorax graculus* (L.) (Yellow-billed Chough), as *probable resident*.

123. *Troglodytes troglodytes kabylosum* Hart. (Wren), as the *resident race*.

124. *Cinclus cinclus aquaticus* Bechst. (or minor Tristr.) (Dipper), as the *resident race*.

171. *Buteo buteo* (Common Buzzard), *perhaps* breeding.

7. Some evidence towards a conclusion on doubtful records:

1 (part). *Corvus corone* (Carriion Crow), as *probable winter visitor*.

11. *Coccothraustes coccothraustes* (Hawfinch), no *breeding* race.

- 19. *Loxia curvirostra* (Crossbill), as *absent*.
- 43. *Alauda arvensis* (Skylark), no *breeding* race.
- 58. *Tichodroma muraria* (Wall-creeper), as *absent*.
- 101. *Turdus torquatus* (Ring Ouzel), no *breeding* race.
- 121. *Prunella collaris* (Alpine Accentor), as *absent*.
- 122. *Prunella modularis* (Hedge Sparrow), no *breeding* race.

In the *North* Moroccan "list" in STATUS (resident or migrant or etc.).

8. Definite confirmation (and negative evidence amounting to the same):

- 22. *Fringilla coelebs coelebs* L. (European Chaffinch), as only a *winter* visitor.
- 86. *Sylvia borin* (Bodd.), (Garden Warbler), of *not breeding*.
- 232. *Phalacrocorax graculus desmarestii* (Payr.) (Shag), of *breeding*.
- Part 306. *Larus argentatus mischaellesii* Bruch (Yellow-legged Herring Gull), of *breeding*.
- 307. *Larus fuscus* (Lesser Black-backed Gull), of *not breeding*.

In the *North* Moroccan list in DISTRIBUTION.

9. Better knowledge of:

- 5. *Garrulus glandarius whitakeri* Hart. (Jay).
- 102. *Turdus merula algerus* (Mad.) (Blackbird).
- 142. *Picus vaillanti* (Malh.) (Le Vaillant's Green Woodpecker).
- 143. *Dryobates major mauritanus* (Brehm.) (Greater Spotted Woodpecker).

10. **Smallness of our Results and "List."**—I feel that some explanation ought to be forthcoming, for although the bad weather somewhat curtailed our work, it did not prevent us having a thorough hunt in all the places we had planned to visit.

The scarcity of birds often alluded to in Part I was not the result of slack field-work; our united comprehension of what constitutes "likely ground" in these latitudes was sufficient—in any case we tried nearly all sorts; we hunted hard enough, but the BIRDS WERE NOT THERE.

Some explanation may be among the following thoughts:

That we expected too much from the "list," which when in doubt is inclined to "optimism."

That our work being all inland, among the hills and mountains, we missed seeing most of the species frequenting the plains, swamps, lakes, lagoons.

That our visit was too short to gauge the "status" of most species; we came too late to discriminate between wintering and migrant individuals of some species, and left too early to be sure whether other species bred or only passed through the country.

That the abnormal stormy weather all through April prevented our seeing so many of the migrants as we might have done in a normal year, and also accounted for the absence of "song" commented on as so marked until the fine weather set in in May.

But nothing short of confirmation can convince me, nor will it any "bird-man" acquainted with these latitudes, that the dearth of Wheatears, Birds of Prey, and such characteristic "Mediterranean" species as the Roller, Hoopoe, etc., can be a normal condition of Yebala's spring.

11. **Migration.**—Our records are given in detail in the Catalogue (Part II). All this part of N.W. Africa is well known to be a great "highway" of migration. The outstanding features with us this year seem to be firstly a general *lateness* (see Rufous Warbler and other notations), and secondly, marked *suspension* during the half of April, when one would have expected migration to be about its normal maximum. The abnormal weather conditions were clearly the cause of the latter, and probably had much to do with the former too.

If, as is thought by some, rise of temperature is, or is the principal factor in, the stimulus that causes migrant birds to start on their spring journey, or conversely, if cold weather retains them in their winter quarters or arrests their progress, then one may suggest as a cause of the general *lateness* the unusual coldness of April.

This, we know, extended to South Marocco, but how much farther south we are not likely to know.

The "warm wave" theory, which has the support of considerable fact, or at least circumstantial evidence, is suggestive in our case, either of the abnormal weather conditions having extended right away south to Senegal and tropical Africa, which is surely improbable? or, assuming that once having started from their winter quarters, the birds would not, or could not, stop in numbers for any length of time in the desert (oases included), of an unusual pack of migrant birds in *South Marocco* in mid-April.

I fear we are not likely to get the facts necessary for testing either of these suggestions.

The *suspension* of migration must have been due largely to the heavy rains. We have ample evidence to show that it is "types of" weather rather than "fine" weather, over wide areas, which, if not embracing both, must include the departure, rather than the arrival point, that chiefly influence passage-flight, and we know that birds do not, cannot, fly for any length of time in heavy rain. I think nearly all our evidence goes to show that if birds on passage get caught in heavy rain over the wide sea, and they cannot find a ship to settle on, or make land pretty quickly, they "drown."¹ If overland, then, of course, the migrants come down and shelter.

But my particular point is that *with us*, during those nine days of deluge April 20–28, no birds *were there* taking shelter, that none² *could have been* flying over while the rain was pouring down and that *none came along* during the few fine intervals: in short, that migration was in suspension so far as our point of observation was concerned, until the fine weather set in in May, when at once crowds of migrants appeared on the scene.

The cold storms of that period were widespread: was the whole migration stream across N.W. Marocco held up? and if so, where? or did it in whole or part diverge and steer clear of the storms, or did it just carry on across the lowlands during the finer intervals which were more frequent and of longer duration there than with us?

If the first, then N.W. Europe and Great Britain might be expected to have shown something of lateness too; if not, then the storms of S.W. Europe would

¹ See *Brit. Birds*, vol. xvii. p. 131, re homing pigeons, also *Brit. Birds*, vol. iii. p. 141 *et seq.*, and many other records on this subject.

² The few stray specimens of migrant species which we managed to pick up during the clearings do not forbid the use of the word "none" in so large a phenomenon as bird-migration.

probably not have materially affected the migration over N.W. Europe, where the weather-type was "north-westerly" and *not* rainy.

Here, too, I fear, we cannot advance far beyond the realms of speculation, but the facts are worth emphasis for the future study of migration in Morocco.

12. "**Geographical Distribution.**"—In my Middle Atlas paper of 1920 I made some remarks on "geographical distribution" in Morocco.

The facts acquired since 1920 are too few and small to make any alteration in its main substance, and I do not intend to bring it up to date in detail. Analysis by tables of figures and statistics are generally boring, because they can seldom be put in a digestible form for readers not already engrossed in the subject, and I now think are best omitted except when necessary to support a controversial statement or a broad conclusion; also that since no conclusions on this big problem of Nature can be useful if based on a study of Birds alone, it is best for the Ornithologist to present his facts in a more plastic form.

I will therefore merely attempt to show here, very roughly, the extent to which North Morocco exhibits Individuality through its Birds, selecting for that purpose examples of known resident and breeding forms, whose distribution seems to be due to something, such as present environment, etc., not now obvious.

The only forms known to be peculiar to North Morocco, *Fringilla coelebs koenigi*, *Galerida cristata kleinschmidti*, and possibly the *Athene*, are so nearly related to neighbouring forms as to throw an almost negligible weight into the scale, but when we compare its "list" with those of the territories adjacent to North Morocco we find the following:

A. *North Morocco differs from S.W. Spain*, from which it is separated by the Straits of Gibraltar:

in having *Harpolestes*, *Pycnonotus*, *Diplootocus*, *Aquila rapax*, *Buteo ferox*, *Elanus*;

in lacking *Aegithalos*, *Parus cristatus*, *Saxicola oenanthe*;

in having different Species of *Gecinus*, *Alectoris*;

in having different Races of *Corvus corax*, *Garrulus glandarius*, *Fringilla coelebs*, *Emberiza cia*, *Galerida cristata* and *theklae*, *Parus coeruleus* and *ater*, *Lanius excubitor*, *Dryobates major*, *Athene noctua*.

B. *North Morocco differs from N. Algeria*, from which it is separated by the (semi-desert) territory of Lower Moulouya:

in having *Sitta*;

in having different Races of *Fringilla coelebs*, *Galerida cristata* and *theklae*, *Parus ater*, *Dryobates major*, *Athene noctua*.

C. *North Morocco differs from Central Morocco*, from which it is separated by the "Détroit Sud-Rifain":

in having *Sylvia undata*;

in lacking *Eremophila*, *Saxicola oenanthe*, *Choriotis*, *Numida*;

in having different Races of *Garrulus glandarius*, *Fringilla coelebs*, *Galerida cristata* and *theklae*, *Certhia brachydactyla*, *Lanius excubitor*, *Athene noctua*.

(If South Morocco were added the differences would be considerably increased.)

So that, although North-Marocco has very few bird-forms quite peculiar to itself, it really has very considerable Individuality in relation to the territories surrounding it.

A very rough idea of the proportion in which its boundaries contribute

towards this Individuality (though it must be quite dissociated from the notion that these boundaries are to be considered as the barriers that have *caused* it, thereby solving the problem !) may be conveniently expressed as something of this sort :

Straits of Gibraltar	85 per cent.
Moulouya	10 per cent.
"Détroit Sud-Rifain "	15 per cent.

I have already put the case for North Marocco's claim to consideration as a convenient *geographical* unit, and if it be agreed from what we can see of its Birds, that a corresponding Individuality is likely to be found in other departments of Biology, an additional zest is added to the Ornithological first-step of making a satisfactory "list" of the birds of North Marocco, which brings me to my final point, viz.:

13. Future Work.—If it be agreed that a satisfactory "list" of the birds of any area cannot be made except from a reliable record of Kind, Status, and Distribution of its bird-forms, then we shall see at a glance, thanks to the clear way in which Dr. Hartert and Mr. Jourdain have marshalled the facts and guided discrimination between them and the doubtful records, that much work will have to be done in North Marocco before even a satisfactory "list" of its birds can be made. Particularly do we want to know the Status of many of the Species ; to know merely that such and such a bird has been, or is to be, found in such and such a place, is a very "bald" fact, if unaccompanied by the knowledge of whether it is so as a "Resident" or a "Summer visitor" or what ?

Then, we want a record from "The low Rif," which, even now, is accessible to the naturalist : there must be interesting semi-desert forms there, as of larks and chats ; and we should be sure of gaining valuable information from it concerning the distribution of bird-forms in the Algero-Maroccan borderland on its eastern edge.

"The high Rif" cannot yet be explored, but we may hope that it will soon be accessible. If any "great surprises" are to come from North Marocco, it will be more likely from those high summits and conifer forests than from anywhere else in the country—though I am not very sanguine about it.

Lastly, there is "Yebala." Here and there in Part II of this paper I have pointed out certain specific objectives for future workers, but those who study the present "record" will readily perceive what, besides a great deal of confirmation of doubtful records, requires to be done.

May we hope that our Spanish ornithological friends will take up the subject ?



NOTES ON SOME BIRDS FROM BURU

By ERNST HARTERT, PH.D.

THE avifauna of Buru, the westernmost of the Southern Moluccas, has recently, after a somewhat long interval, been fairly well explored, and the results of most of the recent expeditions since Doherty's visit to Buru in 1897 are in the Tring Museum. Stresemann was the first to stay a longer time in the highlands, and after his thorough work, carefully described in Nov. Zool. xxi. 1914, not very much seemed to remain unknown on Buru, as far as the occurrence of resident species was concerned. It must, however, not be forgotten that a large part of the island is covered with forest and very thick, impregnable bush, and, if one considers how long it takes to bring together all the birds of a civilized country with all commodities of roads and transport, it seems unreasonable to believe that every species occurring on Buru should have been obtained, notwithstanding the excellent work done on the island by the various collectors who have visited Buru, and especially by Stresemann, during a stay of about three months.

It is therefore not surprising that the brothers Pratt, the experienced collectors of lepidoptera, who worked a long time on Buru in 1922, especially in the mountain ranges, for Mr. Joicey, and made remarkable discoveries of butterflies and moths, discovered also several birds new to Buru, among them a fine new species, *Madanga ruficollis*. Though primarily out to collect lepidoptera, they also brought together a collection of 200 birdskins. Of these the Tring Museum acquired 32, which complete its Buru ornis, as far as known, almost entirely. The rest of the collection has passed into the British Museum. Except the new *Madanga ruficollis* they collected 5 species new to the Buru fauna: *Fulica atra australis*, *Sterna s. sumatrana*, *Falco severus papuanus*, *Pitta elegans elegans*, *Erythrura trichroa pinaiae*. They discovered the adult male of *Prioniturus mada* and the second known specimen of *Accipiter hiogaster pallidiceps*. It is a pity that, from information received, these very able collectors do not at present continue their collecting expeditions in the eastern archipelago.

No doubt the plan of the recent collectors to search the mountains was the best, as there most of the endemic forms might be expected, and their expectations have come wonderfully true; on the other hand, it seems to me that the plains of Buru, especially near Kayeli, require some further attention. It was there where one of the rarest of the parrots, *Tanygnathus gramineus*, was shot, and where my beautiful *Tyto cayelii* (*Strix cayelii*, Nov. Zool. 1900, p. 228) was found.

In 1921 Dr. Toxopeus of Amsterdam collected about 600 birds on Buru, but the results of his collection are not yet fully known. This gentleman first obtained the male of *Prioniturus mada*, and there are now two alive in Buitenzorg in Java, while others brought home to Holland have died. A few notes about this are published in the *Handelingen* (Proceedings) of the "Tweede Nederlandsch-Indisch Natuurwetenschappelijk Congres," Bandoeng, May 1922. Toxopeus also tells me that he got a *Tanygnathus gramineus*

"brought by natives from the mountains" and a specimen of *Tyto cayalii*, and that his notes on the supposed *Androphilus disturbans* in the *Handelingen* really refer to *Locustella fasciolata*, a Siberian bird that visits the Moluccas on migration—which explains that he found it in the plains, while Stresemann correctly described the *Androphilus* as a mountain bird. In fact, all *Androphili* are mountain birds. Full notes on Toxopeus' collection, I understand, will shortly be published by Dr. Siebers in Buitenzorg.

In the following notes I have only mentioned and discussed the most interesting birds collected by Pratt Bros. Of the other species they collected the following are the more noteworthy ones: *Columba mada* (common), *Egretta alba modesta*, *Dupetor flavicollis gouldi*, *Hemiprocne mystacea confirmata*, *Erythromyias buruensis buruensis*, *Dendrobiastes hyperythrus alifurus*, *Microeca addita*, *Pitta rubrinucha rubrinucha*, *Pachycephala griseonota examinata*, *Pachycephala pectoralis buruensis*, *Myzomela wakoloensis*, *Stigmatops deningeri*; of *Zosterops* only *Z. buruensis* was obtained.

For fullest information about the Buru avifauna see Stresemann, Nov. Zool. 1914, pp. 358–400.

Treron aromatica aromatica (Gm.).

This beautiful and not at all common species was collected at Wa Fehat, 2,400 feet high, 10.iv.1922. "Bill black and grey. Iris grey. Feet reddish."

(*Columba mada mada* was found fairly common in the mountains of N.W. Buru.)

Ptilinopus rivolii buruanus Hart. & Goods.

Ptilinopus rivolii buruanus Hartert & Goodson, Nov. Zool. 1918, p. 347 (Buru).

This distinct subspecies is easily distinguished from *P. r. prasinorrhous*, its nearest ally, by the greater amount of yellow on the under tail-coverts. It is also generally smaller. Wings: ♂, 122–128 mm. It has been found by nearly all collectors and seems to occur in all parts of the island. Pratt Bros. brought two from Wa Fehat, 2,700 feet high, one from the "Mada Range" 5,000 feet high.

Porphyrio melanotus melanotus Temm.

Porphyrio melanotus Temminck, *Man. d'Orn.*, 2nd ed., ii. p. 701 (Oct. 1820—"Nouvelle Hollande").

"♂" Fogha, W. Buru, 16.ii.1902. Heinr. Kühn coll. Ad., "Buru," 4.iv.1922. Pratt coll.

Stresemann, Nov. Zool. xxi. p. 362, enumerated the Buru Purple Coot as "*Porphyrio calvus* Vieill." According to some literature (Schlegel, Mus. Pays Bas) this would be correct, but our two specimens are uniform purplish blue underneath, like Australian specimens, and very different from so-called *calvus*. The Java form has the chest "greenish cobalt, contrasting with the rest of the under surface, which is rich purplish blue" as it has been well described by Sharpe. Our two Buru examples, however, are underneath uniform purplish blue, only the middle of the lower abdomen being blackish. I cannot see any differences between these Buru specimens and those from Australia (except S.W. Australia).

While mentioning these Purple Coots I must correct the nomenclature recently in use for some of them. First of all I must say that the Australian

and other forms are certainly of the same specific chain of forms as the Javan form. Mathews & Iredale, *Manual B. Australia*, i. p. 210, say that it "did not seem justified" that I "ranged the species westward to Java," but theirs is merely an unjustified statement of their opinion, as they state no reason whatever why this should not be done. The fact is that most birds from the Moluccan Islands, New Guinea, and Celebes are somewhat intermediate between the Java-Sumatran and the Australian forms. Their chest-patch is not quite so greenish cobalt, and their thighs not in such striking contrast to the sides of the abdomen as in Java birds, but they are not uniform underneath like the common Australian form. Therefore there is no better instance in which trinomials should be used than in this case. These birds have been called *smaragdinus*, but this name cannot possibly be applied to it. *Porphyrio smaragdinus* Temminck, Pl. Col. 421 (1826—"Java & Banda"), is a synonym of *Porphyrio indicus* Horsfield, *Trans. Linn. Soc.* xiii. p. 194 (published 1821), type Java! Temminck's figure and description of his *smaragdinus* are absolutely clear and refer to the bird from Java, from where he had a number of specimens; he says it is also found on Banda, but there are no Banda specimens in the Museum in Leyden, while Sumatra examples agree perfectly with the Java ones. Recent authors have adopted the name *calvus* (*Porphyrio calvus* Vieillot, *Nouv. Dict. d'Hist. Nat.*, 2nd ed., xxviii. p. 28 (1819—no locality!)) for the Java form, but without reason! Hardly any recent authors seem to have looked up and read Vieillot's description, as they quote "Java" as the typical locality of *calvus*! This error arose evidently from Elliot's article in *Stray Feathers*, vii. 1878, where on page 16 Elliot quotes Java as the locality, and on page 17 he says: "This species is generally known as *Porphyrio indicus* of Horsfield, but it was described two years previously by Vieillot as *P. calvus*, which is the name it should properly bear. The specimen in the Paris Museum, which I believe is Vieillot's type, came from Java." There was, however, no reason for believing that a Java specimen in Paris is Vieillot's type; on the contrary, Pucheran, in his valuable list of Vieillot's types in Paris, does not mention it! Moreover, the Java form does not agree with Vieillot's description, as the underside is not all violet blue, but the foreneck and chest are greenish cobalt, in contrast with the rest of the underside. As the description of *calvus* agrees with a number of forms and no locality is given, we must consider it as doubtful, and I should quote it with a query as a synonym of *P. melanotus*!

The oldest name of the S.W. Australian form may possibly be *Porphyrio cyanophalus* [sic!] Vieillot, *Nouv. Dict. d'Hist. Nat.*, 2nd ed., xxviii. p. 28 (1819—no locality!), because Vieillot says that the feet are green, but this also must remain uncertain, because the back is called blackish brown and the forehead orange yellow, and no locality has been given. Mathews says that the feet are green, but on the labels of our skins they are not always quoted as merely green, but partially as orange in parts, and in one as red—and in 1921 Mathews says "olive-green to reddish." Elliot says that "*cyanophalus*" should read "*cianocephalus*," and Sharpe (*Cat. B.* xxiii. p. 205) endorses this opinion by saying it was "doubtless correct." There is, however, absolutely no reason for this opinion. How could Vieillot call a bird of which he says that "la tête en entier" is of a "brun noirâtre," the blue-headed *Porphyrio*? It is absurd to assume this, but nothing is more probable than that Vieillot wished to call the bird "*cyanophaeus*," meaning blue and dusky, a very suitable name, and used by

him in other genera in the combination *leucophaeus*. An *e* and *l* are of course very easily mistaken for each other, and the same error has been committed elsewhere in print.

I see that Stresemann also calls the Purple Gallinule from Ceram *Porphyrio calvus*! This is less incorrect than calling our Buru specimens by that name, but our Ceram example is not like the Javan "*calvus*" (recte *indicus*!), but it agrees with specimens from the Sudest and Trobriand Islands, from some other Moluccan Islands, Celebes, and parts of New Guinea in being somewhat intermediate between *P. melanotus melanotus* (Australia) and *P. melanotus indicus* (Java, Sumatra, Kangean, Borneo), the chest-patch being more purplish than in *indicus*, but still in contrast with the rest of the underside. I have shown above that the name *smaragdinus* cannot be used for this form, but we may call it *P. melanotus melanopterus*. Bonaparte created this name with an inadequate description and without stating a locality (*Compt. Rend. Acad. Paris*, xliii. p. 599 (1856—as seen in the Leyden Museum from Temminck MS!), but the types from Ceram are in the Leyden Museum, and therefore we may accept this name for the birds from Ceram and other islands mentioned above.

Now there are, however, in the Leyden Museum skins, obtained on Buru by Hoedt, which have the light chest-patch like the Ceram birds, and we have also received from St. Aignan (Louisiade group), among specimens with the light chest-patch, i.e. *P. m. melanopterus*, one of the Australian form, but I believe that the specimens of *P. m. melanotus* are migrants from Australia, where there seems to be a certain amount of migratory movement, at least certain places are entirely left when the flat lakes, which all *Porphyrio* love, dry out in the dry season.

I therefore recognize the following subspecies :

Porphyrio melanotus indicus Horsf., Java, Sumatra, Kangean, Borneo.

P. m. melanopterus Bp., Moluccas, New Guinea, and Papuan Islands.

P. m. melanotus Temm., Australia (except south-western area).

P. m. fletcheræ Mathews, Tasmania.

(Of this form we have only one skin, the only one Mathews had when describing this form, but there is another in the British Museum. The specimen is so much larger (specially bill and wings) than Australian specimens, that probably this subspecies is "very good," but it is regrettable that Mathews has not stated how few specimens he examined! Thus the reader is left in the dark on what grounds the author based his judgment, which may be good or not.)

P. m. bellus Gould, south-west Australia.

(In the *B. Australia*, i. p. 238, duly named as a subspecies of *P. melanotus*, but in the *Manuel*, p. 210, as a species, without explanation. *P. m. woodwardi* Mathews, 1912, from S.W. Australia, is now duly admitted to be a synonym of *bellus*, and it is regrettable that even *P. m. bellus*, of which Mathews & Iredale say, "Restricted to south-west Australia and therefore no subspecies" has now a synonym!)

I am unable to separate *P. m. neomelanotus* Mathews, which is figured in the *B. Australia*, i. pl. 60—while *P. m. melanotus* remains unfigured in that work—described from a beautiful fresh skin from N.W. Australia, as its supposed difference, more ultramarine underside, is not constant.)

All the described forms from the Pacific Islands seem to be separable, but of some of them I have not examined sufficient material. They are : *P. m.*

stanleyi from New Zealand, *P. m. chathamensis*, *samoensis*, *vitiensis*, *pelewensis*, *aneitumensis*, *elliotti* (Admiralty Islands), *neobritannicus*, *caledonicus* (like *bellus* but apparently much smaller), and *mertoni* Berl. from the Key Islands.

***Fulica atra australis* Gould.**

Fulica australis Gould, *Proc. Zool. Soc. London*, 1845, p. 2 (W. Australia).

Fulica atra ingrami Mathews, *Nov. Zool.* xviii. p. 196 (1912—Alexandra, Northern Territory).

♂, 2.v.1922, Rana Lake,¹ 2,400 feet. "Bill light grey, feet blue-grey, iris red."

The Australian form differs from *F. atra atra* in having less white at the tips of the secondaries, if any at all, bill and frontal shield more grey, not white, and in being smaller. *F. a. ingrami* differs in no way whatever; the author says it is blacker on the head and underside, but this is not the case. (The Tasmanian form has also been separated, but is probably also inseparable; we have, however, insufficient unsexed material from Tasmania, and I cannot look up the original description in the Tring Museum. I can therefore not finally decide.)

F. a. australis is new to the Moluccan fauna.

***Sterna sumatrana sumatrana* Raffl.**

Sterna sumatrana Raffles, *Trans. Linn. Soc. London*, xiii. p. 329 (1822—Sumatra).

1 ad., Laksola, on the coast of Buru, 6.vi.1922.

Not yet registered from Buru, but having occurred on Ceram and Celebes, as well as many other islands from Australia to Sumatra and Malay Peninsula, its occurrence there was to be expected. I use trinomials for this bird, because *Sterna sumatrana mathewsi* Stresemann, *Nov. Zool.* 1914, p. 61 (Aldabra !), seems to me to be a well-founded form, having the wings shorter and bill rather long. They overlap in a few specimens only, but the series gives obviously smaller measurements of the wings. On the other hand, the supposed differences of *S. sumatrana kempi* Mathews, 1912 (*Nov. Zool.* xviii. p. 210), do not exist in a series from Australia, and *kempi* is therefore a synonym of *sumatrana*. (About the name *sumatrana* versus *melanauchen* Temm., see Mathews, *B. Austr.* ii. p. 370.)

***Accipiter hiogaster pallidiceps* (Salvad.).**

Urospizias pallidiceps Salvadori, *Ibis*, 1879, p. 474 (Buru).

Accipiter hiogaster pallidiceps Stresemann, *Nov. Zool.* pp. 73, 381.

(♀) ad., Rana Lake, Central Buru, 2,400 feet, 10.v.1922.

This specimen agrees perfectly with the descriptions given by Salvadori and Stresemann, but it must be a female as it is very much larger, wing 232 mm., as opposed to 197 in the ♂ type, the only other known specimen. I should not call the underside "sehr blass zimtfarben" in this beautiful fresh specimen, but perhaps the type, shot 44 years ago, has faded a little, having been mounted nearly half a century.

This is the second known specimen in Europe.

¹ This, Dr. Toxopeus tells me, is the lake which was formerly "erroneously called Wakoholo" or Wakolo.

***Accipiter erythrauchen ceramensis* (Schleg.).**

This interesting Hawk inhabits Ceram and Buru. Pratts shot a beautiful adult female at the Kunturun swamp, 2,700 feet high,¹ May 22nd, 1922. Wing 211 mm.

***Falco severus papuanus* Meyer & Wiglesw., 1893.**

(♀) ad., Rana Lake, 2,400 feet, 10.v.1922.

"Iris brown. Bill horn-black, at base yellow. Feet yellow."

This species is new to the Buru list. The form *papuanus* is very near to *F. severus severus* (terra typica Java), but the tail is darker, generally uniform black, not slate-colour, with more or less barring, and the general colour is somewhat darker. The Indian form (*F. s. indicus* Mey. & Wiglesw.) is more distinct and paler.

***Prioniturus mada* Hart.**

Prioniturus mada Hartert, *Nov. Zool.* vii. p. 230 (1900—Buru).

So far only the females of this species were known. Hoedt, over 50 years ago, Dumas, 1898, Deninger and Stresemann only obtained females! Pratt Bros., however, found this species not at all rare at Wa Fehat and Gamu M'Rapat, at elevations from 2,700 and 5,000 feet, and collected nine specimens. The adult male has the forehead and crown grass-green, nape, hind-neck, adjoining uppermost part of back, lesser wing-coverts and a patch on the rump lavender-blue, rest of upperside green. Underside green, middle of throat with a bluish tinge, abdomen more yellowish green, under tail-coverts bright yellow, the shorter ones sometimes with greenish tips. Protruding part of central rectrices for 20–30 mm. bare, at tip a blue and green "racket" of 8–15 mm. in length. One of the females has also rackets, but with the bare portion of the shafts only 15 mm. long. Wings: ♂, 174, 180, 186, 172, 182; ♀, 172, 177, 177 mm. Toxopeus also discovered the male and had a number of live specimens.

***Micropsitta bruijini* (Salvad.).**

Only a single specimen was so far known from Buru, collected by Kühn on Mt. Fogha. Pratt Bros. brought home an adult male shot on Lake Rana, Central Buru, 2,400 feet high, 20.v.1922. Wing 68 mm.

***Centropus bengalensis medius* Bp.**

A number of specimens were collected, one much larger than any one known, wing 210 mm., collected at Wa Fehat, 2,700 feet high. "Iris red." Marked "♀."

***Caprimulgus macrurus mesophanis* Oberh.**

Cf. *Nov. Zool.* 1918, p. 322.

A beautiful male, Buru, 24.iii.1922. It is larger than *C. m. kuehni* Rothsch. & Hart., from Key Islands, the wing measuring 192 mm.

¹ Kunturun is "a peat-moor" discovered by Dr. Toxopeus, but he gives the elevation as 3,300 feet (in litt.). He says it is there where Pratt brothers did most of their collecting.

Pitta elegans elegans* Temm.(Pitta irena auct. errore !)**Pitta elegans* Temminck, Pl. Col., text to plate 591 (1836—Timor !).

[It is strange that this name has been quoted as *Pitta irena* by many others and that the latter came into common use. Since it was used by Salvadori in his great work and by Sclater in the *Cat. B.*, it is no wonder that it was also adopted in the first edition of Elliot's *Mon. Pittidae*. There is, however, no such name as *Pitta irena* in the text to the plate, in livraison 100, which was published 1836, but Temminck, in the contents of his book, in systematic arrangement, published 1839, calls the birds erroneously *P. irena*, thus being himself the originator of this silly mistake. In the second edition of his *Monograph of the Pittidae* Elliot calls the species *Pitta coronata* (*P. c.* Müller, *Natursystem*, Suppl. p. 144, 1776, ex Daubenton), but this plate is so bad that I do not accept it. The locality "Bengale" may have been incorrect, as no Bengal *Pitta* has a black throat, but *P. elegans* has not a black neck either! It is therefore unwise to accept the name of *coronata* for a bad figure with uncertain locality, and the species must be called *P. elegans*!

Lord Rothschild and I have carefully compared the specimens in the British Museum with ours, and there is no doubt that *P. elegans* (Timor) and *crassirostris* (Sula Is.) are inseparable. The latter is not larger and has no thicker bill than Timor and Buru specimens. This has already been stated by Elliot. It must be remembered that Wallace compared his "*crassirostris*" with *vigorsii* and *concinna* and that he knew "*P. irena* from Timor," i.e. *elegans*, only from Temminck's plate. As we have hitherto with certainty only known this form from Timor, Samao, and the Sula Islands—both *Sula Mangoli* and *Sula Bessi*—the new locality Buru is very interesting, so to say connecting the chain. Cf. Nov. Zool. 1902, p. 549, 1922, p. 378.]

Pratt Bros. shot a male and a female 5,000 feet high on the "Madang Range," 24.iv.1922. They marked them "Bill black. Iris brown. Feet flesh-colour." Wings: ♂, 120; ♀, 116 mm.

As stated above this *Pitta* has hitherto not been known to occur on Buru!

***Geocichla dumasi* Rothsch.**

Pratt Bros. found this endemic species at Wa Fehat, 2,400 feet, at Gama M'Rapat, 5,000 feet, and on Mt. Tagalago, 3,000 feet high, not very rare. At Wa Fehat on May 20th and Gamu M'Rapat, 10.iv.1922, young birds were obtained; they have on the upperside buff shaft-lines; the spots on the wing-coverts are not pure white but tinged with yellowish brown; the throat is not black but white with a faint greyish tinge; the jugulum buff or white with black spots, each feather being whitish with black tip and base. Adult birds like the type and Stresemann's specimens, wing, ♀ ad., 86, 88 mm.

***Phyllergates cucullatus dumasi* Hart.**

On Gamu M'Rapat at about 5,000 feet, young birds 10.iv.1922.

***Androphilus castaneus disturbans* Hart.**

Wa Fehat, 2,700 feet, Central Buru, 4,000 feet.

The adult female has the abdomen darker, much more rufous-brown than that of Stresemann. It had the "bill black, lower mandible brownish. Iris brown. Feet brown." Wing 92 mm. The throat is not so extensively white. Perhaps the supposed ♀ of Pratts is the hitherto undescribed ♂. (Of the allied *A. castaneus musculus* Stres. from Ceram, also only females are known.)

***Madanga ruficollis* Rothsch. & Hart.**

Madanga ruficollis Rothschild & Hartert, *Bull. B.O. Club*, xliii. p. 118 (March 1923—Madung or Fogha range, Buru).

This peculiarly coloured bird appears to be a member of the "*Zosteropidae*," but generically different from *Zosterops*. Its upperside is yellowish green, but head and neck ashy grey. The throat is bright cinnamon rufous, rest of underside dark grey, under tail-coverts yellowish brown. For fuller description see *Bull. B.O. Club*, l.c.

Three specimens were shot at Wa Fehat, 2,700 feet, in April, one at the "Mada range," 5,000 feet, also in April. One at Wa Fehat, 8.iv, one at Mada Range, 9.iv.

***Erythrura trichroa pinaiae* Stres.**

Erythrura trichroa pinaiae Stresemann, *Nov. Zool.* 1914, p. 147 (Gunong Pinaia, Middle Ceram).

"♂," Gamu M'Rapat, Mada Range, "Central Buru," 5,000 feet, 17.iv.1922. "Bill blackish. Iris bluish white [*sic* ?]. Feet straw-colour."

This specimen agrees perfectly with the younger male of *E. t. pinaiae*, except that the upperside is somewhat brighter green, the abdomen is a little more greenish, and the forehead darker with a faint indication of blue. As it is also smaller than the males collected by Stresemann, I think it is erroneously marked "♂" and is really an adult ♀.

Wing 59.5 mm.

Hitherto only known from Ceram, where Stresemann collected two specimens.

TYPES OF BIRDS IN THE TRING MUSEUM

BY ERNST HARTERT, PH.D.

B. Types in the General Collection.¹ IV.

MEROPES.

1183. *Merops viridis cleopatra* Nicoll = *Merops orientalis cleopatra*.*Merops viridis cleopatra* Nicoll, *Bull. B.O. Club*, xxvii. p. 11 (1910—Egypt).

Type: ♂ ad., Mazghouna, near Giza, 6.iii.1908. M. J. Nicoll leg. No. 436.

1184. *Merops viridis beludschicus* Neum. = *Merops orientalis beludschicus*.*Merops viridis beludschicus* Neumann, *Orn. Monatsber.* 1910, p. 80 ("Südost-Persien, Beludschistan, und Indus-Ebene").

Type: ♂ ad., Sarbac, Persian Baluchistan, 18.xi.1900. M. Härms leg.

1185. *Melittophagus sharpei* Hart. = *Melittophagus pusillus sharpei*.*Melittophagus sharpei* Hartert, *Bull. B.O. Club*, x. p. xxvii (1899—"The East African Bird," a very sweeping and misleading statement, as the type was from the Hand, Somaliland; *Nov. Zool.*, 1900, p. 35 ("Shoa, Somaliland, and the coast districts of East Africa to Mombasa, Dar-es-Salaam, Lamu, and Melindi, type Haud, Somaliland").

Type: ♂ ad., The Haud, 22.vii.1894. Dr. A. Donaldson Smith Coll. No. 65.

The various forms of *M. pusillus* have been separated lately into a number of subspecies, some more or less closely allied, though certainly distinguishable. The nomenclature has suffered some confusion, and I am sorry to say I have added to the latter, but hope now to clear up our recent errors. East African birds first received a name in 1869 as follows:

Melittophagus erythropterus (Gm.) An dist. ? = *Merops cyanostictus* Cab. MSS., Cabanis, v. d. Deckens Reis. O. Afr., iii, 1, p. 34, 1869.

The name *cyanostictus* was doubtfully proposed, if found to be constant, for 4 specimens in spirits from Mombasa and 3 from Dschagga—restricted *terra typica* Mombasa.

Melittophagus cyanostictus Cabanis, *Journ. f. Orn.* 1875, p. 340 (E. Africa and also Natal and Loango!). In the descriptions in both cases distinguished from birds from Senegal and N.E. Africa (!), the distinct blue superciliary line being mentioned, but nothing about the connecting blue frontal line!

In 1899 and 1900 I separated *sharpei*, as quoted above, and made the wrong statement that Cabanis' type was the same as Sharpe's *meridionalis*! Afterwards I was informed by Sharpe and Reichenow that I altogether made a mistake, that *cyanostictus* differed from *meridionalis* and that my *sharpei* was identical with

¹ Continued from NOVITATES ZOOLOGICAE, 1922, p. 412. See NOVITATES ZOOLOGICAE, 1918, pp. 4-63; 1919, pp. 124-178; 1920, 425-505; and 1922, pp. 365-412.

cyanostictus. I acquiesced in this, but while certainly *meridionalis* differed from *cyanostictus*, my *sharppei*, restricted to Somaliland and southern Shoa, must be kept separate after all! The specimens from Somaliland and Shoa differ from typical *cyanostictus* of the East African coast region, Mombasa, Maunga, to Nairobi, Fort Hall, to Mt. Elgon, etc., in having the blue superciliary line extending further back, right to the end of the head, connected across the forehead by a blue band, and in fresh plumage mostly of a darker blue. *M. p. sharppei*, Somaliland, S. Shoa, south, at least, to Tuni on the Tana River (H. Blayney Percival leg.), must therefore be added to the list of subspecies of *M. pusillus*.

1186. *Melittophagus mulleri yalensis* van Som. = *Melittophagus mülleri yalensis*. *Melittophagus mulleri yalensis* van Someren, *Bull. B.O. Club*, xl. p. 26 (1919—"Elgon and Suk, and Kavirondo").

Type: ♂ (in moult), Lerundo, N. Kavirondo, 17.iii.1917. J. W. Allen Turner leg., for Col. Meinertzhagen. No. 1742.

Van Someren says that he compared seven skins and that they agreed perfectly in the characters given for his new race. He left us only the type-specimen which was presented to Tring by Col. Meinertzhagen. This certainly differs from West African *M. m. mülleri*, of which *batesiana* Sharpe is a synonym; the blue underside is less deep and less purplish, but not "brighter," nor would I call the chestnut above brighter, though it is certainly lighter.

† 1187. *Dicrocercus hirundineus omoensis* Neum. = *Dicrocercus hirundineus heuglini*.

Dicrocercus hirundineus heuglini Neumann, *Bull. B.O. Club*, xvi. p. 113 (1906—Upper White Nile). *Dicrocercus hirundineus omoensis* Neumann, *Bull. B.O. Club*, xvi. p. 114 (1906—Omo River, described from a single male).

Type: ♂ ad., near Koscha on the Omo River, southern Abyssinia, 20.ii.1901. It is curious how rare this species is in E. and N.E. Africa.

There appears to be no doubt that *D. h. omoensis* is the same as *heuglini*. I agree with Claude Grant and Selater & Praed, cf. *Ibis*, 1915, pp. 292–293, 1919, p. 663. The shade and intensity of the blue colour in these birds is rather variable, though different in the three known subspecies.

UPUPAE.

? † 1188. *Scoptelus aterrimus major* Neum. ? = *Scoptelus aterrimus major*.

Scoptelus aterrimus major (in the heading the editor changed the spelling to *maior*, according to his habit, but in the list of subspecies the original spelling of the author remained unaltered) Neumann, *Journ. f. Orn.* 1905, p. 197 (one specimen from Suksuk River).

Type: ♂ ad., Suksuk River, south Abyssinian Lake district, 27.xi.1900. Oscar Neumann leg. No. 296.

I doubt that this race is distinct. We have from southern Abyssinia: 2 ♂ Jattaba, Arussi, 11.xii.1917, Kovacs leg., wing 111, 106; ♀ Seddo, Hauash, 30.xi.1915, Kovacs leg, wing 101; 3 ♀ Lac Daka, Boule Boule R., Hauash River, Trofimoff leg, wings 100, 101, 101 mm., i.e. as long as the wing of a female collected by Schrader in Erythrea. Males from the latter country have wings of 105 (about), 106, 106. The wing of the type of *S. a. major* measures 113 mm., and it

is probably an exceptionally long-winged specimen. There is nothing in the supposed colour differences, as the colours are rather variable. A series from the Suksuk River is, however, wanted to decide finally about this form.

1189. *Scoptelus aterrimus cryptostictus* Hart. = *Scoptelus aterrimus cryptostictus*.

Scoptelus aterrimus cryptostictus Hartert, *Nov. Zool.* 1921, p. 108 (Air).

Type : ♂ ad., Mt. Baguezan, 5,200 feet, 5.vi.1920. A. Buchanan leg.

? † 1190. *Scoptelus pallidiceps* van Som. = ? *Scoptelus adolfi-friderici*.

Scoptelus adolfi-friderici Reichenow, *Orn. Monatsber.* 1908, p. 160 (Ituri River).

Scoptelus pallidiceps van Someren, *Bull. B.O. Club*, xxxv. p. 116 (1915—"Mabira and Kasala Forests, Uganda; Mumias Forest, British East Africa"); also *Nov. Zool.* 1922, p. 83.

Type : ♂, Kasala Forest, 14.v.1914. V. G. L. van Someren leg.

Oscar Neumann, in litt., is of opinion that "*S. pallidiceps*" is the same as *S. adolfi-friderici*, which is very near *brunneiceps*.

1191. *Irrisor erythrorhynchos abyssinicus* Neum. = *Phoeniculus erythrorhynchos abyssinicus*.

Irrisor erythrorhynchos abyssinicus Neumann, *Orn. Monatsber.* 1903, p. 181 ("Abyssinische Gebirge vom Bogosland im Norden bis in die Berge des südlichen Aethiopiens im Süden").

Type : ♂ fere ad. (still some brown feathers on throat), Arba-Schiko, Anseba River, 17.iii.1903, Erythrea. G. Schrader leg.

The various forms of *P. erythrorhynchus* require further elucidation. While *P. e. niloticus* Neum. appears to be well distinguishable, his *neglectus* seems to be founded on younger black-billed specimens, but of *abyssinicus* no entirely red-billed example seems to be known; though the supposed colour-differences of *abyssinicus* from *niloticus* (and *neglectus*) do not hold good, it must be kept separate, until red-billed birds in the countries inhabited by it are found—if they should exist. Doubtless the bills of *niloticus* become red much later than those of other red-billed subspecies, but they do become red in old birds! (*Phoeniculus* Jarocki 1821 antedates *Irrisor*!)

BUCEROTES.

1192. *Rhytidoceros everetti* Rothschild. = *Rhytidoceros everetti*.

Rhytidoceros everetti Rothschild, *Journ. f. Orn.* 1897, p. 513 ("Monjeli, Sumba." Monjeli error for Manjeli); see also *Nov. Zool.* 1898, p. 472.

Type : ♂, Manjeli, Sumba Island, autumn 1896. Collected by one of Alfred Everett's trained natives.

Rhyt. narcondami is not of the same size, but considerably smaller!

1193. *Lophoceros granti* Hart. = *Lophoceros granti*.

Lophoceros granti Hartert, *Nov. Zool.* 1895, p. 55 (Aruwimi River).

Type : Ad., Aruwimi River, Upper Congo. W. Bonny, of the ill-fated Emin Pasha Relief Expedition's Rear-Column, leg.

Mr. Rudolf Grauer sent a male from Kindu Forest near Baraka, 400 m. high, 16.ii.1909, and another from the forest 340 km. west of Baraka, 600 m. high, 29.i.1909.

1194. *Lophoceros melanoleucos geloensis* Neum. = *Lophoceros melanoleucos geloensis*.

Lophoceros melanoleucos geloensis Neumann, *Journ. f. Orn.* 1905, p. 187 (Upper Gelo River, one specimen).

Type : ♂ ad., Shekko, Upper Gelo River, 24.iv.1901. Oscar Neumann leg. No. 1160.

Requires confirmation by series, but from the evidence of the single specimen appears to be distinct, there being more white on the head.

CORACIÆ.

1195. *Eurystomus afer aethiopicus* Neum. = *Eurystomus glaucurus aethiopicus*.

Eurystomus afer aethiopicus Neumann, *Journ. f. Orn.* 1905, p. 184 ("Süd-Aethiopien, ferner auch Gebiet des Blauen Nils").

Type : ♀ ad., Shekko on the Upper Gelo River, 25.iv.1901. Oscar Neumann leg. No. 1162.

This form is very closely allied to *E. glaucurus afer* from Senegal to Niger, and *E. glaucurus rufobuccalis* from Uganda; it is generally larger than *E. g. afer*, but the colour differences are not constant, freshly moulted examples being very different from worn ones! *E. g. rufobuccalis* is separable by the colour of the sides of the head, but even of this race single specimens are difficult to distinguish. *E. g. pulcherrimus* is a better, more striking subspecies.—Neumann overlooked that *glaucus* is a much older name than *afer*, but I agree that they are subspecies.

1196. *Eurystomus gularis neglectus* Neum. = *Eurystomus gularis neglectus*.

Eurystomus gularis neglectus Neumann, *Orn. Monatsber.* 1908, p. 28 ("Von Kamerun bis nach Angola, im Innern bis zum Central-Seen-Gebiet").

Type : ♂ ad., Canhoca (Angola), 17.xi.1903. W. J. Ansorge leg. No. 1150.

1197. *Eurystomus orientalis neohanoveranus* Hart. = *Eurystomus orientalis neohanoveranus*.

Eurystomus neohanoveranus [sic!] Hartert, *Nov. Zool.* 1901, p. 185 (New Hanover).

Type : Ad., Expedition Bay, New Hanover, 22.iii.1897. Cayley Webster leg.

1198. *Eurystomus orientalis gigas* Stres. = *Eurystomus orientalis gigas*.

Eurystomus orientalis gigas Stresemann, *Nov. Zool.* 1913, p. 299 (Southern Andaman Is.).

Type : ♂ ad., Rutland I., S. Andamans, 4.iii.1907. B. B. Osmaston leg.

1199. *Eurystomus orientalis connectens* Stres. = *Eurystomus orientalis connectens*.

Eurystomus orientalis connectens Stresemann, *Nov. Zool.* 1913, p. 302 ("Inselkette von Kangean und Lombok bis Tenimber; Djampea, Kalidupa, Süd-Celebes").

Type : ♂ ad., Moa Island, 18.xi.1902. Heinrich Kühn leg. No. 6126.

This form is separable from *E. o. pacificus* of Australia, but it seems to me that the darker upperside is even a better character than the brighter, more bluish underside which Stresemann only mentioned.

1200. *Leptosomus discolor intermedius* Hartert & Neumann, subsp. nov.

Type : ♀ ad., Anjouan I., Comoro Is., 7.x.1906. Krishnasamy Naidoo leg.

Like *Leptosomus discolor discolor* from Madagascar, but very much smaller. The Madagascar form of *Leptosomus* is large and the females have very deep brown tails; the form from Great Comoro, *L. discolor gracilis*, is much smaller and the females have light chestnut-red tails, the head and back are much lighter, and the underside is less heavily spotted. The females from Anjouan (Johanna) Island are as small as those of *L. d. gracilis*, but the tail is deep brown, only on the outer webs sometimes with a good amount of chestnut red, upper- and underside are coloured as in *L. d. discolor*. The males are like those of *L. d. gracilis*, that is to say much smaller than those of *L. d. discolor*—in colour the males of the three subspecies do not differ. We have no specimens from Mayotte, but they are as large as the Madagascar ones and apparently indistinguishable.

Wings : *L. discolor discolor*, ♂, 253–261; ♀, 259–270 mm. *L. discolor gracilis*, ♂ 215–224; ♀, 216–227. *L. discolor intermedius*: ♂, 220–227; ♀, 238–255. Besides the smaller wings of *L. d. intermedius* the very much smaller bill of both sexes distinguishes them at a glance from *L. d. discolor*. In all forms the females average larger. Years ago Professor Oscar Neumann called my attention to this form, but as neither of us had found time to describe it so far, we decided to take this opportunity to name it, as above.

1201. *Uratelornis chimaera* Rothsch. = *Uratelornis chimaera*.

Uratelornis chimaera Rothschild, *Nov. Zool.* ii. p. 479 (1895—Madagascar); see also *Nov. Zool.* iii. 1896, pl. ii.

Type : Adult, Madagascar. Purchased from a dealer.

The Tring Museum has since received another specimen which agrees with the original description and figure, but is in much better plumage, the wings and tail not worn, while in the type they are rather badly worn. The bill of this second specimen is shorter, 36 mm. from base to tip, quite 39 in the type. Wing 111, in the type 114; tail: middle rectrices 235, in the type about 275, but undoubtedly longer, because worn. Possibly the smaller bird is a female but nothing is known about the sex of either of these two birds. This second specimen is probably one of those sent to Paris by Mr. Bensch or Mr. Bastard, who discovered the species in the sandy plains near the S.W. coast of Madagascar, where it was also found by M. M. Geay in 1906.

PSITTACI.1202. *Eos bornea rothschildi* Stres. = *Eos bornea rothschildi*.

Eos bornea rothschildi Stresemann, *Nov. Zool.* xix. p. 340 (1912—Ceram); also *Nov. Zool.* 1914, p. 80.

Type : ♂ ad., Manusela, Ceram, 3,000 feet, 13.vi.1911. Erwin Stresemann leg. No. 649.

† 1203. *Eos kühni* Rothsch. = *Eos bornea bernsteini*.

Eos bernsteini Rosenberg, *Nat. Tijdschr. Ned. Ind.* xxv. p. 145 (1863—Key Islands).

Eos kühni Rothschild, *Nov. Zool.* v. p. 110 (1898—Key Islands).

Type : ♂ juv., Toeal, Little Key, Key Islands, 19.x.1897. Heinr. Kühn leg. No. 226.

1204. *Eos variegata obiensis* Rothsch. = *Eos variegata obiensis*.*Eos variegata obiensis* Rothschild, *Bull. B.O. Club*, x. p. xvi (1899—Obi Major Island, Moluccas).

Type: Adult, Obi Major, October to December 1898. W. Lucas leg.

1205. *Eos insularis* Guill. = *Eos variegata insularis*.*Eos insularis* Guillemard, *Proc. Zool. Soc. London*, 1885, p. 565, pl. 34 ("Weeda Is., a coral group hitherto unvisited by any naturalist, lying to the east of the extreme south point of Halmaheira or Gilolo").

Type: ♂ ad., Weeda Is., 16.x.1883. Powell leg.

As Dr. Guillemard had 4 males and a female, this form must be admitted, though, of course, as a subspecies of *E. variegata* = *riciniata*. The differences, however, require some confirmation and modification. Dr. Guillemard says it is larger: this is strikingly born out by our specimen, but not by his own measurements! Our bird has a wing of 154 mm., as against 137–147 in *variegata*, while Guillemard quotes 138, 144, 146, 146, and 152 for his *insularis*. The blue patch on the occiput is quite separated in our *insularis*, and usually widely connected in *variegata* (*riciniata*), but we have two from Ternate in which it is only brokenly and narrowly connected, while Guillemard had one in which the occipital spot is partially connected with the nuchal collar. Dr. Guillemard also made a point of the red iris, while he found it yellow in Batjan and Ternate specimens. This last character is also not an absolutely certain difference, as we have a male from Batjan in which Dr. Platen marked the iris as orange red, and one from the same island on which W. Doherty stated "iris chiefly red (outwardly), then black, then whitish." It is thus evident that *insularis* is a subspecies of which all distinguishing characters are variable, though obvious in a series.

1206. *Lorius hypoenochrous devittatus* Hart. = *Domicella hypoinochroa devittata*.*Lorius hypoenochrous devittatus* Hartert, *Nov. Zool.* 1898, p. 530 ("The low country of S.E. New Guinea, Fergusson, Woodlark, New Britain, and New Ireland," type Fergusson).

Type: ♂ ad., Fergusson Island, d'Entrecasteaux group, September 1894. Albert S. Meek leg.

1207. *Lorius hypoenochrous rosselianus* Rothsch. & Hart. = *Domicella hypoinochroa rosseliana*.*Lorius hypoenochrous rosselianus* Rothschild & Hartert, *Nov. Zool.* xxv. p. 312 (1918—Rossel Island).

Type: ♂ ad., Mt. Rossel, Rossel Island, Lousiade group, 14.xi.1915. A. S. Meek Coll. No. 6831.

1208. *Lorius lory major* Rothsch. & Hart. = *Domicella lory major*.*Lorius lory major* Rothschild & Hartert, *Nov. Zool.* viii. p. 66 (1901—Waigiu Island).

Type: ♂ ad., Waigiu, 25.x.1883. Dr. H. Guillemard leg.

In the description it is said "wing shorter," which is of course a slip, as the measurements show that the wings are longer! The island of Waigiu, if thoroughly explored, will yield still a number of hitherto unknown forms. The brothers Pratt have recently discovered there many new forms of lepidoptera.

1209. *Trichoglossus haematodus intermedius* Rothsch. & Hart. = *Trichoglossus haematodus intermedius*.

Trichoglossus haematodus intermedius, viii. p. 70 (1901—"Kaiser Wilhelm's Land").

Type: ♂ ad., Stephansort, December 1899. E. Nyman leg. No. 9.

1210. *Trichoglossus haematodus fortis* Hart. = *Trichoglossus haematodus fortis*.

Trichoglossus haematodus fortis Hartert, *Nov. Zool.* v. p. 120 (1898—Sumba Island).

Type: ♂ ad., Waingapo, Sumba I., September 1896. Alfred Everett leg.

1211. *Trichoglossus haematodus flavotectus* Hellm. = *Trichoglossus haematodus flavotectus*.

Trichoglossus haematodus flavotectus Hellmayr, *Avifauna von Timor*, p. 79 (1914—Wetter and Roma Islands).

Type: ♀ ad., Roma, 25.vii.1902. Heinrich Kühn leg. No. 02725.

1212. *Trichoglossus forsteni djampeanus* Hart. = *Trichoglossus forsteni djampeanus*.

Trichoglossus forsteni djampeanus Hartert, *Nov. Zool.* iv. p. 172 (1897—Island of Djampea).

Type: ♀ ad., Djampea Island, between South Celebes and Flores, December 1895. Alfred Everett leg.

1213. *Trichoglossus johnstoniae* Hart. = *Trichoglossus johnstoniae*.

Trichoglossus johnstoniae Hartert, *Bull. B.O. Club*, xiv. p. 10 (1903—Mt. Apo, S. Mindanao).

Type: ♂ ad., Mt. Apo, 8,000 feet, April 1903. Walter Goodfellow leg.
This striking species is figured in the *Avicultural Magazine*.

1214. *Hypocharmosyna rubrigularis krakari* Rothsch. & Hart. = *Charmosynopsis rubrigularis krakari*.

Hypocharmosyna rubrigularis krakari Rothschild & Hartert, *Nov. Zool.* xxii. p. 31 (1915—Dampier or Krakar Island, north coast of Papua).

Type: ♂ ad., Dampier Island, 16.ii.1914. A. S. Meek's Expedition (Eichhorn). No. 6678.

A series from New Britain is wanted! There is a slip in the description: the red patches are on the outer rectrices, not outer primaries!!

1215. *Charmosynopsis placentis pallidior* Rothsch. & Hart. = *Charmosynopsis placentis pallidior*.

Charmosynopsis placentis pallidior Rothschild & Hartert, *Nov. Zool.* xii. p. 253 (1905—Bougainville, Solomon Is.).

Type: ♂ ad., Bougainville Island, 8.v.1904. A. S. Meek Coll. No. A 1757:

1216. *Hypocharmosyna meeki* Rothsch. & Hart. = *Charmosynopsis meeki*.

Hypocharmosyna meeki Rothschild & Hartert, *Nov. Zool.* viii. p. 187 (1901—Kulambangra I., Solomon Is.).

Type: ♂ ad., Kulambangra Island, 22.ii.1901. A. S. Meek Coll. No. 2783.
(Figured *Nov. Zool.* ix.)

1217. *Charmosynopsis multistriata* Rothsch. = *Charmosynopsis multistriata*.

Charmosynopsis multistriata Rothschild, *Bull. B.O. Club*, xxvii, p. 45 (1911—Upper "Letekwa"—should be Setekwa—River, east of Oetakwa River, slopes of Snow Mountains in southern central Dutch Papua).

Type : ♂ ad., Upper Setekwa River, 2.vii.1910. A. S. Meek Coll. No. 4252.

1218. *Charmosyna stellae wahnesi* Rothsch. = *Charmosyna stellae wahnesi*.

Charmosyna stellae wahnesi Rothschild, *Bull. B.O. Club*, xix, p. 27 (1906—"Sattelberg, German New Guinea").

Type : ♂ ad., Sattelberg, inland Huon Gulf, December 1905 or January 1906. Wahnes leg. (per Foerster).

Besides the type we have since received : 3 not quite adult specimens from high altitudes in the Huon Gulf Hinterland, collected by the Rev. C. Keysser, one from the Rawlinson Mts., 1910, also collected by Keysser, none with original labels but labels written by the late Prof. Foerster, from whom we received these specimens. All these five specimens have the yellow breast-band.

1219. *Charmosyna stellae goliathina* Rothsch. & Hart. = *Charmosyna stellae goliathina*.

Charmosyna stellae goliathina Rothschild & Hartert, *Nov. Zool.* xviii, p. 161 (1911—"Mt. Goliath, Central Dutch New Guinea").

Type : ♂ ad., Mt. Goliath, 27.i.1911. A. S. Meek Coll. No. 5211.

† 1220. *Charmosyna atrata* Rothsch. = *Charmosyna stellae stellae*.

Charmosyna atrata Rothschild, *Bull. B.O. Club*, vii, p. liv (1898—"Mt. Scratchley, British New Guinea").

Type : ♂, Mt. Scratchley, collected by Anthony, according to preparation, bought from London merchant.

There is in my opinion hardly any doubt that the striking *Charmosyna atrata* is not, as anyone was entitled to believe without further evidence, a species occurring side by side with *C. stellae stellae* and its subspecies, but a melanistic variety, which appears to be not at all rare, so that Lord Rothschild (see *Nov. Zool.* 1921, pp. 289, 290) is quite justified in calling it a "dimorphic melanistic form," meaning that *C. stellae* is dimorphic or dichromatic. The curious sexual difference, the back of the ♀ green to the blue tail-coverts, that of the ♂ with a wide red band between the green back and the blue tail-coverts, is remarkable. The *C. atrata*, however, occurs apparently wherever *C. stellae* is found. We have now 1 ♂ and 2 ♀ from the mountains of British New Guinea, i.e. the home of *C. stellae stellae*; 1 ♂ and 1 ♀ from Mt. Goliath, 2 ♂ and 2 ♀ from the Weylandt Mts., i.e. the home of *C. s. goliathina*; 1 ♀ from the Hinterland of Huon Gulf, i.e. the home of *C. s. wahnesi*. The latter does not differ from those of British New Guinea, nor could it be expected that the yellow band would remain in a melanistic variety, but the longer upper tail-coverts of the Mt. Goliath and Weylandt Mts. specimens are dark green instead of purplish green as in the eastern specimens; this clearly indicates the difference of *C. s. goliathina*, which differs in a similar way from *C. s. stellae*. This melanism is perhaps much more interesting than another separate species would have been.

1221. *Neopsittacus pullicauda* Hart. = *Neopsittacus pullicauda*.

Neopsittacus pullicauda Hartert, *Nov. Zool.* iii. p. 17 (1896—"Owen Stanley Mts., Victoria district").

Type: Adult, Mt. Victoria, Owen Stanley Mts., Anthony's skin according to preparation. Purchased in London 1895 from merchant.

Occurs both in British New Guinea as well as on the Schraderberg and in the Snow Mts. in Dutch New Guinea at higher altitudes, but it is found also together with *N. musschenbroeki* in most localities.

1222. *Neopsittacus iris wetterensis* Hellm. = *Neopsittacus iris wetterensis*.

Neopsittacus iris wetterensis Hellmayr, *Nov. Zool.* xix. p. 211 (1912—Wetter Island).

Type: ♂ ad., Wetter Island, 18.ix.1902. Heinrich Kühn leg. No. 02918.

This is a quite distinct form, having pale (not "deep") grass-green instead of yellowish green (not "yellowish grey" as said in the diagnosis, apparently by a misprint) cheeks, and much longer wings. The alleged more powerful bill can be of no importance, as the bills are not larger in our single specimen of *N. iris iris*. The type is not well selected, as its crown and nape are exceptionally almost without the purplish blue wash which is usual in *N. i. wetterensis* as well as in *N. i. iris*.

1223. *Cyclopsittacus virago* Hart. = *Opopsitta diophthalmus virago*.

Cyclopsittacus virago Hartert, *Nov. Zool.* ii. p. 61 (1895—Fergusson I., D'Entrecasteaux Is.).

Type: ♂ ad., Fergusson Island, 25.ix.1894. A. S. Meek leg. No. 47.

Possibly it may not meet with general approval if this parrot is looked upon as a subspecies of *O. diophthalmus*; the females are rather different, the males, however, very much alike, and *virago* is only the representative of *diophthalmus* on Fergusson Island.

1224. *Cyclopsittacus inseparabilis* Hart. = *Opopsitta inseparabilis*.

Cyclopsittacus inseparabilis Hartert, *Bull. B.O. Club*, viii. p. ix (1898—Sudest I., Louisiade Archipelago).

Type: ♀ ad., Sudest Island, 1.iv.1898. A. S. Meek Coll. No. 1641.

† 1225. *Cyclopsittacus macilwraithi* Rothsch. = *Opopsitta nigrifrons amabilis*.

Cyclopsittacus amabilis Reichenow, *Bericht* vii. p. 6, *Allg. Deutsche Orn. Ges.*; *Journ. f. Orn.* 1891, p. 427 (Saparako, Huon Gulf).

Cyclopsittacus macilwraithi Rothschild, *Bull. B.O. Club*, vii. p. xxi (northern coast, British New Guinea).

Type: Adult, said to be from the northern coast of British Papua, collected by Anthony, bought from McIlwraith, McEacharn & Co.

Cf. *Nov. Zool.* 1912, p. 194, for synonymy and problem of sexes!

† 1226. *Cyclopsitta blythi meeki* Rothsch. & Hart. = *Opopsitta blythi godmani*.

Cyclopsittacus godmani Ogilvie-Grant, *Bull. B.O. Club*, xxvii. p. 67 (March 1911—Upper Mimika River).

Opopsitta blythi meeki Rothschild & Hartert, *Nov. Zool.* xviii. p. 160 (September 1911—Eilanden River).

Type: ♂ ad., Eilanden River, 10.xii.1910. Albert S. Meek Coll. No. 5056.

1227. *Cacatua parvula occidentalis* Hart. = *Cacatoes sulphurea occidentalis*.

Cacatua parvula occidentalis Hartert, *Nov. Zool.* v. p. 120 (1898—Lombok and Flores, type Lombok).

Type : ♂ ad. (nat. coll.), North Lombok, July 1896. Alfred Everett.

1228. *Cacatua sulphurea djampeana* Hart. = *Cacatoes sulphurea djampeana*.

Cacatus sulphurea djampeana Hartert, *Nov. Zool.* iv. p. 164 (1897—Djampea Island between Celebes and Flores).

Type : ♀ ad., Djampea, December 1895. Alfred Everett leg.

1229. *Nasiterna pygmaea viridipectus* Rothsch. = *Micropsitta keiensis viridipectus*.

Nasiterna pygmaea viridipectus Rothschild, *Bull. B.O. Club*, xxvii. p. 45 (1911—Upper Setekwa River, southern Snow Mts.).

Nasiterna keiensis viridipectus Rothschild & Hartert, *Nov. Zool.* xx. p. 486 (1913—Snow Mountains and Upper Eilanden River).

Type : ♂ ad., Upper Setekwa River, 1.viii.1910. A. S. Meek Coll. No. 4460.

1230. *Nasiterna salvadorii* Rothsch. & Hart. = *Micropsitta pusio salvadorii*.

Nasiterna salvadorii Rothschild & Hartert, *Nov. Zool.* viii. p. 81 (1901—Ambernoh River, northern Papua).

Type : Ambernoh River (Mamberano R.). J. Dumas leg.

This form will probably be confined to the northern coast between Geelvink Bay and Kaiser-Wilhelm Land. Cf. *Nov. Zool.*, 1915, p. 30.

1231. *Nasiterna tristrami* Rothsch. & Hart. = *Micropsitta aolae tristrami*.

Nasiterna tristrami Rothschild & Hartert, *Nov. Zool.* ix. p. 589 (1902—Kulambangra, western central group of Solomon Islands).

Type : ♂ ad., Kulambangra, 11.iii.1901. A. S. Meek Coll. No. 2863.

Later on also discovered by Meek and his collectors on Gizo, Rendova, and New Georgia Islands.

1232. *Micropsitta meeki* Rothsch. & Hart. = *Micropsitta meeki*.

Micropsitta meeki Rothschild & Hartert, *Bull. B.O. Club*, xxxiii. p. 107 (1914—Manus, Admiralty Islands).

Type : ♂ ad., Manus, 25.ix.1913. A. S. Meek Coll. No. 6155.

1233. *Nasiterna viridifrons* Rothsch. & Hart. = *Micropsitta viridifrons*.

Nasiterna viridifrons Rothschild & Hartert, *Orn. Monatsber.* 1899, p. 138 (New Hanover).

Type : Adult, from spirits, Expedition Bay, New Hanover, 22.iii.1897. Cayley Webster Coll. No. 372.

† 1234. *Conurus canibuccalis* Rothsch. = *Aratinga weddellii*.

Conurus Weddellii Deville, *Rev. et Mag. de Zool.* 1851, p. 209 (Pibaús, Upper Amazons River).

Conurus canibuccalis Rothschild, *Bull. B.O. Club*, xix. pp. 48, 64 (Humaytha, Rio Madeira, Brazil)

Type : ♂ ad., Humaytha, 11.viii.1906. W. Hoffmanns leg. No. 1076.

1235. *Conurus arubensis* Hart. = *Aratinga pertinax arubensis*.

Conurus arubensis Hartert, *Bull. B.O. Club*, i. p. xvi (1892—Aruba Island near Curaçao).

Type: ♂ ad., Aruba, 2.vii.1892. Ernst Hartert leg. No. 140.

1236. *Pyrrhura picta amazonum* Hellm. = *Aratinga picta amazonum*.

Pyrrhura picta amazonum Hellmayr, *Bull. B.O. Club*, xix. p. 8 (1906—Obidos, Lower Amazons, Brazil). See also *Nov. Zool.* 1907, p. 36.

Type: ♀ ad., Obidos, north bank of River Amazons, 11.iii.1906. W. Hoffmanns leg. No. 586.

(*Pyrrhura* seems to me only a colour-genus and should be united with *Aratinga*.)

1237. *Pyrrhura hypoxantha* Salvad. = *Aratinga hypoxantha*.

Pyrrhura hypoxantha Salvadori, *Bull. Mus. Zool. Torino*, xiv. No. 363, p. 1 (1899—"Matto Grosso, in sylvis prope Urucum"). See also *op. cit.* xv. No. 378, p. 12.

Type: ♀ ad., Urucum, near Corumbá in S.W. Matto Grosso, Brazil, no date. A. Borelli leg.

Two adult females were obtained, a third seen. No other specimens seem to be known? ?

1238. *Chrysotis rothschildi* Hart. = *Amazona barbadensis rothschildi*.

Chrysotis rothschildi Hartert, *Bull. B.O. Club*, i. p. xiii (1892—Bonaire); *Ibis*, 1893, p. 328, pl. ix.

Type: ♂ ad., near Fontein, Island of Aruba, 17.vii.1892. Ernst and Claudia Hartert leg. No. 199.

Unfortunately Gmelin's name *barbadensis*, *Syst. Nat.* i, p. 339, has page priority over Gmelin's *ochroptera* and doubtless refers to the same bird, which, however, never occurs on Barbados!

† 1239. *Poicephalus meyeri nyansae* Neum. = *Poicephalus meyeri saturatus*.

Poicephalus saturatus Sharpe, *Bull. B.O. Club*, xi. p. 67 (1901—N. Ankole).

Poicephalus meyeri nyansae Neumann, *Nov. Zool.* 1908, p. 383 ("Unyoro, Uganda, Ussoga, Kavirondo").

Type: ♂ Unyoro. Rud. Grauer leg.

I agree with C. H. B. Grant that Neumann's name refers to the form called *saturatus* by Sharpe, ranging from North Ankole to Unyoro, and apparently eastwards to Kavirondo and south to Lake Kivu and Ruwenzori—but this requires further confirmation. C. H. B. Grant quotes Reichenow's *virescens* also as a synonym of *saturatus* (*Ibis*, 1915, p. 260), but *virescens* is a synonym principally of *erythrae*, though he unites with it the Kavirondo birds ("Schoa bis Kawirondo"), and the type locality (not mentioned!) cannot be constructed to be Kavirondo. (See Neumann, *Nov. Zool.*, 1908, p. 383.)

1240. *Poicephalus rufiventris pallidus* van Som. = *Poicephalus rufiventris pallidus*.

Poicephalus rufiventris pallidus van Someren, *Nov. Zool.* 1922, p. 47 (North Somaliland).

Type: ♂ ad., Burao, N. Somaliland, 8.i.1906. G. B. Bury leg. No. 1132.

This form is quite distinct, the upperside, neck, and chest are paler, the red

abdomen lighter, belly and under tail-coverts as a rule more bluish, than in *P. r. rufiventris*, while *P. r. simplex* has a larger bill, but in colour is much nearer *P. r. rufiventris*.

1241. *Poicephalus flavifrons aurantiiceps* Neum. = *Poicephalus flavifrons aurantiiceps*.

Poicephalus flavifrons aurantiiceps Neumann, *Journ. f. Orn.* 1904, p. 376 ("Gebiet der Sobat-Quellströme, Gebirgsgegenden").

Type: ♂ ad., Maschango, Upper Gelo River, 29.iv.1901. Oscar Neumann leg. No. 1174.

Three specimens (not four) of Neumann are before me, and all show the orange-tinged, not deep yellow, forehead. Over 40 specimens from southern Shoa and Galla Land differ by the pure deep yellow, only one from the Galba River, collected by M. Trofimoff, shows an approach to *aurantiiceps*. Neumann's subspecies must therefore be recognized, though the difference is slight.

1242. *Eclectus pectoralis solomonensis* Rothsch. & Hart. = *Lorius roratus solomonensis*.

Eclectus pectoralis solomonensis Rothschild & Hartert, *Nov. Zool.* viii. p. 82 (188, 378) (1901—Solomon Islands).

Type: ♂ ad., Fauro Island, 20.xi.1893. Wahnes & Ribbe Coll.

Differs from *L. roratus pectoralis* not only in its shorter wing but also in its much smaller bill!

1243. *Lorius roratus goodsoni* subsp. nov.

Has the short wing of *L. r. solomonensis* and the large bill of *L. r. pectoralis*. Named after my assistant Mr. Arthur Goodson, who first called attention to the large bill of this new form. The colour of the abdomen in the females is generally lighter, more bluish, but this character is somewhat variable.

Type: ♀ ad., Manus, Admiralty Is., 30.ix.1913. Collected by A. S. Meek's collectors (Eichhorn Bros.). No. 6186.

When mentioning these birds, *Nov. Zool.*, 1914, p. 290, we united them with *L. r. solomonensis* (*Eclectus pectoralis solomonensis*), and did not notice the size of the bills. The latter equal or surpass those of *L. r. pectoralis* from New Guinea, while in *L. r. solomonensis* they are much smaller. Wing: 4 ♂ ad., 240, 241, 254, 255; 4 ♀, 230, 235, 239, 240 mm. Bill from cere to tip, ♂ 43·5–45, ♀ 39–41 mm., measured with compass.

1244. *Geoffroyus timorlaoënsis* A. B. Meyer = *Geoffroyus geoffroyi timorlaoënsis*.

Geoffroyus timorlaoënsis Meyer, *Abhandl.* (not Sitzungsber.!) *Isis*, Dresden, 1884, p. 15 (perhaps not publ. before 1885—Tenimber or Timorlaut Is.).

Cotype (on the label "Typus" written by A. B. Meyer): ♂ ad., Timorlaut, collected by Governor Riedel.

(Mathews, *B. Austr.* vi. p. 25, calls attention to the fact that the names *personatus* and *geoffroyi*, in the *Cat. B.* xx. p. 402, both quoted as published in 1811, were probably not published in the same year. He says "the volume of the *General Zoology* in which Shaw's name appeared" (it would have been shorter and

more helpful and saved one to find out the volume if he had simply quoted vol. viii) has two title-pages, one dated 1812, the other 1811, and he says that 1812 was the correct date. I have no doubt that the later date is probably the correct one, but it is only a supposition, and I call what Mathews calls the "first title-page" undoubtedly the second title-page, the first being the general one of the *General Zoology*, the other the particular one of the *Birds*. As there is any doubt about the date and the great probability that 1812 is the correct year, the name *personatus* which Salvadori adopted is better replaced by *geoffroyi*, which dates from 1811; the sooner we employ the oldest names the better, though only a few who are fond of changing names welcome such alterations when they become known.)

1245. *Geoffroyus aruensis cyanicarpus* Hart. = *Geoffroyus geoffroyi cyanicarpus*.
Geoffroyus aruensis cyanicarpus Hartert, *Nov. Zool.* vi. p. 81 (1899—Rossel Island, Louisiade group).

Type: ♂ ad., Rossel Island, 3.iii.1898. A. S. Meek leg. No. 1523.

1246. *Pseudopsittacus maclennani* Macg. = *Geoffroyus geoffroyi maclennani*.

Pseudopsittacus maclennani Macgillivray, *Emu*, xiii. p. 105 (1913—Pascoe River, North Queensland).

Type: ♂ ad., Pascoe River, Cape York Peninsula, 14.vii.1913. McLennan leg.

This form is hardly separable from true *G. geoffroyi aruensis* from the Aru Islands, but in the majority of true *aruensis* the bill is larger than in the two *maclennani* I have seen, and the underside is a shade more grass-green. Mathews says it differs from the "Aru Island bird" by the coloration of the under wing-coverts, but does not explain how. I find that the under wing-coverts are deeper, more purplish in so-called *aruensis* from British Papua, which must be distinguished as *G. g. orientalis* from *aruensis*, while the Aru Islands specimens have the under wing-coverts paler and less purplish; this is also the case in *maclennani*, where they are even lighter than in the majority of true *aruensis*, but some few are perfectly similar. The upperside is slightly deeper green, the underside a shade less yellowish. Thus *maclennani* is very slightly different indeed, but its discovery in the Cape York Peninsula is of great interest, as the genus *Geoffroyus* is otherwise unknown in Australia.

(On p. 253, vol. vi, *B. Austr.*, Mathews says that the type of *P. maclennani* "is my type of *Geoffroyus geoffroyi macgillivrayi*." This, the author kindly informs me, was "a slip pure and simple, he having in mind his *Lorius macgillivrayi*." This might have been explained in *B. Austr.* vii, suppl. i, p. 84, where *Geoffroyus geoffroyi macgillivrayi* is quoted as a synonym of *maclennani*, and referring to the type of *maclellani*, which it was not meant to do, of course.)

1247. *Geoffroyus sumbavensis* Salvad. = *Geoffroyus geoffroyi sumbavensis*.

Geoffroyus sumbavensis Salvadori, *Cat. B. Brit. Mus.* xx. p. 407 (1891—Sumbawa Island).

Type: ♂ ad., Bima, Sumbawa, 12.viii.1883. H. Guillemard leg.

(We have a ♂ specimen of *Geoffroyus geoffroyi rhodops* from Amboina labelled by Count Salvadori as specimen c of his list in *Orn. Pap. e. Mol.* i. p. 179, and as "Typus, *Geoffroyus schlegelii* Salvad." This would therefore be a cotype of *G. schlegelii* Salvadori, *Ann. Mus. Civ. Genova*, x. p. 29, but there the name is not based on an Amboina specimen, but on Schlegel's *Eclectus rhodops*, which was

rejected on account of Gray's *Psittacus rhodops*, which was a *nomen nudum* attached to specimens from the South Moluccas with erroneous localities. The name *rhodops* is now generally admitted.)

(I take this opportunity to call attention to the fact that the African Parrot now called *Poicephalus fuscicapillus* (*Pionus fuscicapillus* Verr. et Des Murs, 1849) cannot be called by this name, because of *Pionus fuscicapillus* Wagler, 1832, which is a new name for *Psittacus spadiocephalus* Kuhl, 1820, and refers apparently to a female of a *Geoffroyus*, but it is not possible to say which form.)

1248. *Geoffroyus personatus explorator* Hart. = *Geoffroyus geoffroyi explorator*.

Geoffroyus personatus explorator Hartert, *Nov. Zool.* viii. p. 4 (1901—Manawoka in the Goram Islands).

Type : ♂ ad., Manawoka, 14. xi. 1899. Heinrich Kühn leg. No. 1935.

1249. *Prioniturus platurus talautensis* Hart. = *Prioniturus platurus talautensis*.

Prioniturus platurus talautensis Hartert, *Nov. Zool.* v. p. 89 (1898—Lirung or Salibabu, the largest of Talaut Is., north of Celebes).

Type : ♂ ad., Lirong (Lirung), April 1897. John Waterstradt leg.

1250. *Prioniturus discurus* var. *suluensis* W. Blas. = *Prioniturus discurus suluensis*.

Prioniturus discurus suluensis W. Blasius, *Journ. f. Orn.* 1890, p. 140 (Sulu Islands).

Types : ♂ ad., Joló, Sulu, 22. iv. 1887. Dr. Platen leg. (Received in exchange from the late Ad. Nehrkorn.)

† 1251. *Prioniturus cyaneiceps* Sharpe = *Prioniturus platenae*.

Prioniturus cyaneiceps Sharpe, *Ibis*, April 1888, p. 194 (Palawan).

Prioniturus platenae W. Blasius, *Braunschweig. Anzeig.* No. 37, Feb. 12th, 1888 (Palawan).

Type : Taguso, Palawan, 4. viii. 1887. John Whitehead leg. No. 1661.

1252. *Prioniturus waterstradti* Rothschild. = *Prioniturus waterstradti*.

Prioniturus waterstradti Rothschild, *Bull. B.O. Club*, xiv. p. 73 (1904—Mt. Apo, S. Mindanao).

Type : ♂ ad., Mt. Apo, S. Mindanao, 3,000 feet, October 1903. John Waterstradt leg. No. 77.

1253. *Prioniturus mada* Hart. = *Prioniturus mada*.

Prioniturus mada Hartert, *Nov. Zool.* vii. p. 230 (1900—Buru).

Type : Mt. Mada (Madang, Fogha), "3,000 feet," August or September 1898. Dumas leg.

Over 50 years ago the Dutch collector Hoedt obtained a specimen on Buru, which Schlegel mentioned under the name "*Eclectus platurus*." The type was shot by Dumas 1898, afterwards Deninger (1906) got one and Stresemann (1912) another, but all these were females or young males. Dumas' specimen is a young male, Stresemann's a female, perhaps not adult, as shown by the middle rectrices which have no rackets. In 1921 Dr. Toxopeus discovered the adult male and brought home live specimens. In 1922 the brothers Pratt, the successful collectors of lepidoptera, and of birds in New Guinea (see *Nov. Zool.* 1921, p. 280), collected adult males and adult females. They evidently found the species not.

rare in the mountains of the interior, at elevations of from 2,700 to 5,000 feet. The adult ♂ has forehead and crown grass-green, nape, hind-neck, uppermost back, lesser wing-coverts and rump (where the bases and tips of the feathers are greyish blue) lavender-blue, rest of upperside green. Underside green, middle of throat bluish green, abdomen yellowish green, under tail-coverts bright yellow, sometimes with greenish tips except the longest. Protruding part of shaft of central rectrices for about 20–30 mm. bare with a blue and green racket of 8–15 mm. in length. One apparently adult female has also rackets like the male, but with the bare part of the shaft only about 15 mm. long. Another female has the middle rectrices elongated and narrowed, but not bare, and not racket-like; a third has the tips broken away. Wings: ♂, 174, 180, 186, 172, 182; ♀, 172, 177, 177 mm.

1254. *Tanygnathus megalorhynchos floris* subsp. nov.

Nearest to *T. m. sumbensis* A. B. Mey. (from Sumba), but top of head lighter green, back and wings less blue, underside slightly more yellowish. Differs widely from *T. m. megalorhynchos* (Bodd.) (from the Talaut and Sanghir Is., Waigiu, and North Moluccas) in having the underside more green, less yellow, the rump deeper blue, wings shorter. Wings: 3 ♀, 233, 235, 243 mm. The rump is as deep blue as in *T. m. sumbensis*.

Type: ♀ ad., South Flores (Mangarai), October 1896. Alfred Everett leg.
See Nov. Zool. 1898, p. 44.

1255. *Tanygnathus megalorhynchos djampeae* subsp. nov.

Nearest to *T. m. floris*, but rump paler blue (as in *T. m. megalorhynchos*), primaries still more green (less blue, bills larger, wing apparently longer). Wings: ♂, 248; ♀, 263; ♀ jun., 230 mm.

Type: ♀ ad., Djampea Island, December 1895. Alfred Everett leg.

1256. *Palaeornis intermedia* Rothsch. = *Psittacula intermedia*.¹

Palaeornis intermedia Rothschild, Nov. Zool. ii. p. 492 (1895—India).

Type: ♂ ad., a trade skin shipped at Bombay, which evidently came from some part of the Himalayas, as it was accompanied by other Himalayan birds. Six males were received from a plumassier in London. As described by Lord Rothschild these birds are intermediate between *P. schisticeps* and *cynocephalus*, which are both found in the western Himalayas. It is probable that *P. intermedia* is a local form, the habitat of which is not yet known. If it were a hybrid, so many specimens would not very likely have come at the same time,² and one would expect them to vary, but they are all alike.

1257. *Psittacella picta* Rothsch. = *Psittacella picta*.

Psittacella picta Rothschild, Bull. B.O. Club, vi. p. v (Mt. Victoria, Owen Stanley Mts., British New Guinea).

Type: ♂ ad., Mt. Victoria, native coll., purchased.

Cf. plate iii, *Ibis*, 1897, both sexes figured.

¹ According to Mathews, *B. Australia*, vi. p. 169, *Palaeornis* must be replaced by the earlier *Psittacula* of Cuvier!

² Our six males were selected by Mr. Dunstall, a dealer in feathers, from a greater number of these birds, he told us.

1258. *Agapornis pullaria ugandae* Neum. = *Agapornis pullaria ugandae*.

Agapornis pullaria ugandae Neumann, *Nov. Zool.* xv. p. 388 (1908—"Uganda, Karagwe, Ruanda, Unyoro, and the Omo region").

Type: ♂ ad., Entebbe, Uganda, 26.iv.1907. Rud. Grauer leg. No. 61.

This form is very closely allied to *A. p. pullaria* of West Africa, and some individuals, especially females, cannot be distinguished, but it is perfectly true, as Neumann says, that "the rump is never dark blue as in adult specimens of the western form." In *Nov. Zool.* 1922 van Someren said that Uganda and East African specimens were *A. p. ugandae*, but the Masindi ones western *A. p. pullaria*. This is not correct according to the Masindi examples he left us, which agree with other Uganda ones and are *A. p. ugandae*.

1259. *Agapornis swinderianus emini* Neum. = *Agapornis swinderianus emini*.

Agapornis swinderianus emini Neumann, *Bull. B.O. Club*, xxi. p. 42 (1908—Ituri Forest).

Type: ♂ ad., Ituri Forest, 3,800 feet, 14.vii.1906. C. F. Camburn, No. 329.

This form is very closely allied to *A. swinder. zenkeri* from S. Kamerun, but differs in the rump being of a slightly deeper, more purplish blue, and the red nuchal collar less wide, a character which however is often influenced by preparation. The green of the upperside is not darker. Rud. Grauer collected a pair in the primeval forest 340 km. west of Baraka, 600 m. high, nos. 4211, 4223, February 1909.

1260. *Loriculus aurantiifrons meeki* Hart. = *Loriculus aurantiifrons meeki*.

Loriculus aurantiifrons meeki Hartert, *Nov. Zool.* ii. p. 62 (1895—Fergusson Island, d'Entrecasteaux group).

Type: ♂ ad., Fergusson Island, September 1894. A. S. Meek leg. No. 146

1261. *Loriculus aurantiifrons batavorum* Stres. = *Loriculus aurantiifrons batavorum*.

Loriculus aurantiifrons batavorum Stresemann, *Journ. f. Orn.* 1913, p. 602 ("Waigeu, Berau-Halbinsel und das Schneegebirge").

Type: ♂ ad., Snow Mountains, Dutch New Guinea, 19.x.1910. A. S. Meek Coll. No. 4855.

1262. *Loriculus philippensis dohertyi* Hart. = *Loriculus philippensis dohertyi*.

Loriculus philippensis dohertyi Hartert, *Nov. Zool.* xiii. p. 757 (Basilan).

Type: ♂ ad., Basilan Island, January 1898. William Doherty Coll. No. 119898.

1263. *Cyanorhamphus forbesi* Rothsch. = *Cyanorhamphus forbesi*.

Cyanorhamphus forbesi Rothschild, *Proc. Zool. Soc. London*, 1893, p. 529 (Chatham Islands).

Type: Adult, Chatham Islands east of New Zealand. H. C. Palmer Coll.

This very distinct form is a very large edition of *C. auriceps* from New Zealand, from which, however, it does not differ in colour and markings.

1264. *Leptosittaca branickii* Berl. & Stolz. = *Leptosittaca branickii*.

Leptosittaca branickii Berlepsch & Stolzmann, *Ibis*. 1894, p. 402, pl. xi ("Hab. in Peruvia alta centrali, ad. alt. 10,000 ad 13,000 pedum—Maraynioc, Culumachay, Pariayacu, et Huarmipacha").

Cotype: ♀ ad., Maraynioc, 6.vii.1892. J. Kalinowski Coll. No. 1604. Marked "typus" by M. Stolzmann.

1265. *Deroptus accipitrinus fuscifrons* Hellm. = *Deroptus accipitrinus fuscifrons*.

Deroptus accipitrinus fuscifrons Hellmayr, *Nov. Zool.* xii. p. 303 (1905—Pará, Brazil).

Type: ♂ ad., Igarapé-Assú, Pará, 50 m., 19.iii.1904. A. Robert Coll. No. 2020.

COLII.

1266. *Colius leucotis berlepschi* Hart. = *Colius striatus berlepschi*.

Colius leucotis berlepschi Hartert, in Ansorge's *Under the African Sun*, p. 333 (1899—"Central Africa from the White Nile to German East Africa").

Type: ♀ ad., Neu-Helgoland, Lake Nyassa, 17.viii.1895. Dr. Percy Rendall Coll. No. 133).

I confess that I do not yet quite understand the distribution of the forms of *Colius striatus*; I was doubtless wrong in thinking that *C. s. berlepschi* extended from the White Nile to Lake Nyassa; I am now of opinion that this subspecies is only found in the south-western parts of Tanganyika Territory and perhaps, as van Someren says, in N.E. Rhodesia. It is nearest *affinis*, but is darker on the upperside, and apparently also on the underside.

1267. *Colius striatus ugandensis* van Som. = *Colius striatus ugandensis*.

Colius striatus ugandensis van Someren, *Bull. B.O. Club*, xl. p. 26 (1919—"From Lake Albert and Ruwenzori to Elgon and the Turkwell River").

Type: ♂ ad., Chagwe in Uganda, 28.v.1906. V. G. L. van Someren Coll.

1268. *Colius striatus kikuyensis* van Som. = *Colius striatus kikuyensis*.

Colius striatus kikuyensis van Someren, *Bull. B.O. Club*, xl. p. 27 (1919—"South Ukambani to Kavirondo, including the Loita plains and east to Kenia").

Type: ♂ ad., Nairobi, 14.v.1918. V. G. L. van Someren Coll.

I cannot agree with Granvik (*Journ. f. Orn.* lxxi, Sonderheft, pp 95, 96) that *kikuyensis* is not distinguishable from *ugandensis*. Our series shows that *kikuyensis* is a much darker form than *ugandensis*.

1269 *Colius striatus mombassicus* van Som. = *Colius striatus mombassicus*?

Colius striatus mombassicus van Someren, *Bull. B.O. Club*, xl. p. 26 (1919—"Mombasa to Lamu").

Type: ♂ ad., Chagamwe, 19.vii.1918. V. G. L. van Someren Coll.

This form is well distinguishable from *C. s. kikuyensis* and *ugandensis*, but its differences from *C. s. affinis* (restricted typical locality Dar-es-salaam) require confirmation; the throat, breast, and mantle are not always heavier-barred, the underside not always darker. Granvik, l.c., accepted *mombassicus* as a valid race, and he must have seen topotypical *affinis* (from Dar-es-salaam) in the Berlin Museum.

1270. *Colius leucocephalus turneri* van Som. = *Colius leucocephalus turneri*.

Colius leucocephalus turneri van Someren, *Bull. B.O. Club*, xl. p. 27 (1919—"Northern Guasso N'yiyo").

Type : ♂ ad., Northern Guasso N'yiyo, March 1919. V. G. L. van Someren Coll.

The feathers of crown and occiput are light grey, not pinkish cream colour, also the colour between the black bars on the upper back is less pinkish, and the abdomen is lighter yellowish brown. The other differences stated by the author are not genuine, being merely due to the freshly moulted condition of the type-specimen.

1271. *Urocolius macrurus griseogularis* van Som. = *Colius macrurus griseogularis*.

Urocolius macrurus griseogularis van Someren, *Bull. B.O. Club*, xl. p. 27 (1919—"Central Lake District, Kivu, Albert Edward, and N. Tanganyika").

Type : ♂ ad., in thick wood, south shore of Lake Albert Edward, 21.i.1908. Rudolf Grauer Coll. No. 1886.

This is just a darker form of *C. m. pulcher*, to which it is very similar.

MOMOTI.

1272. *Prionirhynchus platyrhynchus minor* Hart. = *Electron platyrhynchus minor*.

Prionirhynchus platyrhynchus minor Hartert, *Nov. Zool.* v. p. 498 (1898—Panama).

Type : ♂ ad., Panama, 13.ii.1889. Father Heyde Coll.

HALCYONES.

1273. *Pelargopsis melanorhyncha eutreptorhyncha* Hart. = *Pelargopsis*¹
melanorhyncha eutreptorhyncha.

Pelargopsis melanorhyncha eutreptorhyncha Hartert, *Nov. Zool.* v. p. 128 (1898—Sula Mangoli).

Type : ♂, Sula Mangoli, October 1897. William Doherty Coll.

† 1274. *Ceryle lugubris continentalis* Hart. = *Ceryle lugubris guttulata*.

Ceryle lugubris continentalis Hartert, *Nov. Zool.* 1900, p. 534 ("Himalaya and Assam").

Ceryle guttulata Stejneger, *Proc. U.S. Nat. Mus.* xv. pp. 294, 295 (1893—India and China).

Type : ♀ ad., Sikkim, 30.iii.1876. H. J. Elwes Coll.

1275. *Ceryle rudis insignis* Hart. = *Ceryle rudis insignis*.

Ceryle rudis insignis Hartert, *Nov. Zool.* xvii. p. 216 (1910—Hainan).

Type : ♂ ad., Hoihow, Hainan, 13.xi.1903. Katsumata Coll.

¹ Oberholser, *Proc. U.S. Nat. Mus.* xxxv. p. 659, says the name *Pelargopsis* must be rejected, because it is a *nomen nudum*. As a description is given it is not a nude name! As the name has been used for nearly half a century and the comparison of the head with that of a stork is not bad, we may as well retain the name as adopted by Sharpe in 1870, though no type was mentioned. Surely our aim should not be to alter and upset as many names as possible, but to retain them if possible and not obviously wrong!

1276. *Alcedo ispida pelagica* Stres. = *Alcedo atthis pelagica*.

Alcedo ispida pelagica Stresemann, *Nov. Zool.* xx. p. 316 (1913—Eastern New Guinea, D'Entrecasteaux and Louisiade Is., type St. Aignan).

Type: ♂ ad., St. Aignan I., 3.ix.1897. A. S. Meek Coll. No. 963.

This form differs only on average size, but many specimens are indistinguishable from *A. a. hispidoides*. Wings: *A. a. pelagica*, 66–72; *A. a. hispidoides*, 68.5–75 mm., according to Stresemann's measurements of 21 and 57 skins.

1277. *Alcedo ispida salomonensis* R. & H. = *Alcedo atthis salomonensis*.

Alcedo ispida salomonensis Rothschild & Hartert, *Nov. Zool.* xii. p. 255 (1905—Central group of Solomon Is., Rendova, and Gizo).

Type: ♂ ad., Rendova I., 10.ii.1904. A. S. Meek Coll. No. A 1244.

Differs not only by a longer wing (73–77 mm.), but also in much darker and more violet blue colours, and a larger bill from *A. i. hispidoides* and *pelagica*. Cf also *Nov. Zool.* 1913, p. 316.

1278. *Alcyone websteri* Hart. = *Alcyone websteri*.

Alcyone websteri Hartert, in Webster's *Through New Guinea*, p. 371, and *Ibis*, 1899, p. 278, pl. iii (New Hanover).

Type: Ad., New Hanover, 20.ii.1897. Cayley Webster Coll. No. 422.

See also *Nov. Zool.* xxi. 1914: Rook Island.

1279. *Alcyone azurea yamdenae* Rothsch. = *Alcyone azurea yamdenae*?

Alcyone azurea yamdenae Rothschild, *Bull. B.O. Club*, xi. p. 65 (1901—Yamdena, Tenimber Is.).

Type: “♂” ad., Yamdena Island, 30.i.1901. H. Kühn Coll. No. 3058.

The type—the only specimen received from Yamdena—is marked ♂, but its small size suggests its being a female. More material is required to make sure whether this is a separate subspecies or not. I have formerly united with *yamdenae* our four specimens from Babber and Romah, which are very dark, but they are larger, except the ♀, which has the wing only 1 mm. longer. The Babber and Romah specimens do not seem to differ from the Cape York subspecies, which is also very dark underneath, but, if the Yamdena bird really is a ♂, then it must be a very small race probably peculiar to the Tenimber or Timorlaut Islands. Could these birds be semi-migratory? The occurrence of only one or two specimens on Aru, Yamdena, Babber, Romah suggests irregular appearance only.

1280. *Ceyx lepida collectoris* R. & H. = *Ceyx lepida collectoris*.

Ceyx lepida collectoris Rothschild & Hartert, *Nov. Zool.* viii. p. 376 (1901—“Solomon Is.” type, Kulambangra, cf. p. 186).

Type: ♂, Kulambangra I., Solomon Is., 28.ii.1901. A. S. Meek Coll. No. 2809.

1281. *Ceyx lepida nigromaxilla* R. & H. = *Ceyx lepida nigromaxilla*.

Ceyx lepida nigromaxilla Rothschild & Hartert, *Nov. Zool.* xii. p. 256 (Guadalcanar).

Type: ♀, Guadalcanar, 18.iv.1901. A. S. Meek Coll. No. 2925.

1282. *Ceyx solitaria mulcata* R. & H. = *Ceyx lepida mulcata*.

Ceyx solitaria mulcata Rothschild & Hartert, *Bull. B.O. Club*, xxxv. p. 24 (1914—New Hanover).

Type : Adult, New Hanover, 18.ii.1897. Cayley Webster Coll.

C. lepida is No. 1 on the plate and first in the text. The above two forms seem to bridge over the hiatus between the two supposed species, and I regard them as belonging to the same species.

1283. *Ceyx meeki* Rothsch. = *Ceyx meeki*.

Ceyx meeki Rothschild, *Bull. B.O. Club*, xii. p. 23 (1901—Isabel Island, Solomon Is.) (Plate, *Nov. Zool.* ix).

Type : ♂, Isabel Island, 13.vi.1901. A. S. Meek Coll. No. 3269.

1284. *Ceyx dispar* Rothsch. & Hart. = *Ceyx dispar*.

Ceyx dispar Rothschild & Hartert, *Bull. B.O. Club*, xxxiii. p. 106 (1914—Admiralty Is.) ; *Nov. Zool.* 1914, p. 292.

Type : ♂, Manus, Admiralty Is., 6.ix.1913. A. S. Meek's Exped. (Eichhorn Bros.). No. 5979.

Both sexes of this species, which are rather different, are figured *Nov. Zool.*, 1914, pl. x.

1285. *Myioceyx ruficeps ugandae* Som. = *Myioceyx ruficeps ugandae*.

Myioceyx ruficeps ugandae van Someren, *Bull. B.O. Club*, xli. p. 105 (1921—Lugalambo, Mabira, Budongo).

Type : ♂, Budongo in Uganda, 1.vi.1919. V. G. L. van Someren Coll.

The type-specimen, the only one before me now, has the tiny spots on the occiput more bluish, forehead a little wider black, crown a little darker chestnut, the ultramarine blue back darker. The original description mentions only the "more decided blue spots on the head," but I do not find them to be "more decided," though more decidedly blue.

1286. *Syma torotoro meeki* R. & H. = *Syma torotoro meeki*.

Syma torotoro meeki Rothschild & Hartert, *Nov. Zool.* viii. p. 147 (1901—S.E. New Guinea).

Type : ♀ ad., Milne Bay, 26.x.1898. A. S. Meek Coll. No. 2116.

1287. *Syma torotoro ochracea* R. & H. = *Syma torotoro ochracea*.

Syma torotoro ochracea Rothschild & Hartert, *Nov. Zool.* viii. p. 148 (1901—Fergusson and Goodenough Islands).

Type : Goodenough Island, 9.xii.1896. A. S. Meek Coll. No. 29.

1288. *Syma torotoro tentelare* Hart. = *Syma torotoro tentelare*.

Syma torotoro tentelare Hartert, *Nov. Zool.* iii. p. 534 (1896—Aru Islands).

Type : ♀ ad., Wanambai, Aru Is., 24.vi.1896. Cayley Webster Coll.

1289 *Halcyon owstoni* Rothsch. = *Halcyon albicilla owstoni*.

Halcyon owstoni Rothschild, *Bull. B.O. Club.* xv. p. 6 (1904—Asuncion Island, Northern Marianne Islands).

Type: ♂, Asuncion I., 16.i.1904. From Alan Owston's collectors

This distinct form has been fully described, l.c. Its systematic position was, however, not recognized. It is, in fact, a subspecies of *H. albicilla* from the southern Marianne Islands (series from Saipan), differing only in having the bill shorter and a large greenish-blue patch on the crown of the head! All our Saipan birds except one have a small green-blue patch on the crown; the type was described as having a quite white crown, while young birds are supposed to have the entire crown greenish blue. I wonder if they were not from another island and a third form, or young of *owstoni*? Surely some of the other Marianne Islands must also be inhabited by some form of *H. albicilla*, and probably there are even more than two subspecies. *H. albicilla saurophaga* is also a subspecies of *H. albicilla*.

1290. *Halcyon australasia tringorum* Hellm. = *Halcyon australasia tringorum*.

Halcyon australasia tringorum Hellmayr, *Avifauna von Timor*, p. 69 (1914—Roma Island).

Type: ♂ ad., Roma, 20.vii.1902. Heinr. Kühn Coll. No. 5179.

1291. *Halcyon australasiae dammeriana* Hart. = *Halcyon australasia dammeriana*.

Halcyon australasiae dammeriana Hartert, *Nov. Zool.* vii. p. 19 (1900—Dammer Island).

Type: ♀ ad., Dammer, 25.xi.1898. Heinr. Kühn Coll. No. 1110.

1292. *Halcyon australasia interposita* Hart. = *Halcyon australasia interposita*.

Halcyon australasia interposita Hartert, *Nov. Zool.* xi. p. 196 (1904—Letti and Moa).

Type: ♂, Moa, 2.xii.1902. Heinr. Kühn Coll. No. 6281.

1293. *Halcyon tristrami alberti* R. & H. = *Halcyon tristrami alberti*.

Halcyon tristrami alberti Rothschild & Hartert, *Nov. Zool.* xii. p. 256 (1905—Kulambangra, Rendova, Gizo, Bougainville).

Type: ♂ ad., Kulambangra, 21.ii.1901. A. S. Meek Coll. No. 2780.

1294. *Halcyon perplexa* R. & H. = *Halcyon perplexa*.

Halcyon perplexa Rothschild & Hartert, *Nov. Zool.* xv. p. 361 (1908—San Christoval I., Solomon Is.).

Type: ♂ fere ad., Yanuta, San Christoval, 20.iv.1908. A. S. Meek Coll. No. 4007.

(See remarks about species, but I think *H. perplexa* is the representative of *H. tristrami* on San Christoval.)

1295. *Halcyon sordidus colonus* Hart. = *Halcyon sordida colonus*.

Halcyon sordidus colonus Hartert, *Nov. Zool.* iii. p. 244 (1896—Egum Island, Egum Group).

Type: ♂ ad., Egum I., between D'Entrecasteaux Is. and Woodlark, 25.vii. 1895. A. S. Meek Coll. No. 154.

This very distinct subspecies also extends to the Louisiade Islands, where Meek collected it on St. Aignan, Rossel, and Sudest Island.

1296. *Halcyon bougainvillei* Rothschild. = *Halcyon bougainvillei*.

Halcyon bougainvillei Rothschild, *Bull. B.O. Club*, xv. p. 5 (1904—Bougainville Island, Solomon Islands).

Type: ♂ ad., Bougainville I., 11.v.1904. A. S. Meek Coll. No. A 1770. Plate in *Nov. Zool.*, 1905, pl. x, both sexes figured.

1297. *Halcyon enigma* Hart. = *Halcyon enigma*.

Halcyon enigma Hartert, *Nov. Zool.* xi. p. 199 (1904—Talaut Is. north of Celebes).

Type: ♂ ad., Lirong, Talaut Is., April 1897. Collected by John Waterstradt's hunters.

(I have fully explained, i.e., that I am not sure if this is a subspecies of *H. chloris*, which occurs together with *H. enigma* on Talaut, as I cannot say for certain that both nest there, and am therefore obliged to name it provisionally with binomials, and not trinomially).

1298. *Halcyon chelicuti eremogiton* Hart. = *Halcyon chelicuti eremogiton*.

Halcyon chelicuti eremogiton Hartert, *Nov. Zool.* 1921 p. 106 (North Hausaland and Zinder).

Type: ♀, Zinder, 10.ii.1920. Angus Buchanan Coll., No. 356.

1299. *Monachalcyon monachus intermedius* Hart. = *Monachalcyon monachus intermedius*.

Monachalcyon monachus intermedius Hartert, *Nov. Zool.* iv. p. 163 (1897—Tawaya, north of Palos Bay, W. Celebes).

Type: ♂ ad., Tawaya, September 1896. William Doherty Coll.

(Messrs. Meyer & Wigglesworth say that, while *intermedius* is a subspecies of *M. monachus*, their *capucinus* may stand as a species, and that I agree to this. I am, however, decidedly of opinion that *capucinus* is also a subspecies of this group and *intermedius* obviously connects the two other forms.)

1300. *Tanysiptera hydrocharis vulcani* R. & H. = *Tanysiptera hydrocharis vulcani*.

Tanysiptera hydrocharis vulcani Rothschild & Hartert, *Nov. Zool.* 1915, p. 42 (Vulcan Island, 10 ♂♀ ad.).

Type: ♂ ad., Vulcan Island or Manumudar, 30.xi.1913. A. S. Meek's Exp. (Eichhorn leg.). No. 6324.

1301. *Tanysiptera danae intensa* R. & H. = *Tanysiptera danae intensa*.

Tanysiptera danae intensa Rothschild & Hartert, *Bull. B.O. Club*, xlii. p. 91 (1922—

Type: ♂, Hydrographer Mts., W. of Dyke Acland Bay, S.E. Papua, 20.iv.1918. Eichhorn Bros. coll. No. 7894 of the Meek Collections.

1302. *Tanysiptera nigriceps leucura* Neum. = *Tanysiptera nigriceps leucura*.

Tanysiptera nigriceps leucura Neumann, *Orn. Monatsber.* 1915, p. 180 (Rook Island, between New Guinea and New Britain).

Type: ♂ ad., Rook I., 5.viii.1913. No. 5924 of Meek Coll., Eichhorn Bros. leg.

(Neumann described this subspecies from our notes in *Nov. Zool.* xxi. p. 212, 1914, where we stated the differences, but could not decide, because our material from *T. n. nigriceps* from Duke of York I. and New Britain was quite insufficient. Neumann has seen a good series in the Berlin Museum, and correctly stated that specimens from these islands never have a perfectly white tail. He agreed with me in conversation that the above specimen should be considered as the type.)

ON THE SATURNOIDEAN FAMILIES OXYTENIDAE AND CERCOPHANIDAE

By DR. KARL JORDAN.

(With Plates VI-XXI.)

IN this second instalment of our monograph of the *Saturnioideae* (cf. Nov. Zool. xxix. p. 249, 1922) we deal with a few American genera which do not conform with the generally accepted type of a Saturnian and which for that reason may be considered aberrant. But their aberrancy consists more in having preserved some ancestral traits in their constitution than in having wandered along lines of development of their own. The six genera in which we place the 37 species belong to two groups which have nothing in common except that they both stand at the outskirts of the great bulk of the Saturnioideans—each in its own place. It is of no importance for the present whether we consider these groups as constituting two tribes, subfamilies or families. We will call them families in order to emphasize that they fit neither in the *Ceratocampidae* nor the *Saturniidae*. Further investigations may possibly reduce them to a lower rank in the systematics of the *Saturnioideae*.

FAMILY : OXYTENIDAE fam. nov.

The species of this group belong to genera of which the position in classification has hitherto been doubtful. Guenée, Herrich-Schäffer, and the Felders recognised their affinity with the Saturnians, but other authors remained very uncertain about the place which should be assigned to these moths.

We have explained in Nov. Zool. xxx. p. 166 (1923) that the *Saturnioideae* differ from all the allied families in the total absence of a frenulum (not only of its bristles, but also of its base in the wing-membrane), and said that "*Oxytenis*, *Asthenidia*, and some other genera" agreed herein with the *Saturnioideae* and not with the *Eupterotidae* and *Bombycidae*, the only families with which these moths might possibly be placed. We therefore classify them with the *Saturnioideae*, reducing the genera to three.

The family differs from all the other *Saturnioideae* particularly in the proboscis being fairly strong and bearing large carinate papillae, in the antenna being bipectinate in both sexes, with the branches arising on the ventral side (Pl. xii. fig. 11), and the shaft being scaled to the tip, in the spurs of the mid- and hindtibiae (Pl. xii. fig. 10) being scaled to the apex and not having a strongly chitinised claw-like tip, and in the hindwing having a well-developed precostal vein. Labrum transverse, more or less convex, but not projecting as a cone or ridge; a deep groove (hole) at each side of it. Proboscis quite distinct and rolled in; its carinate papillae recall the seeds of Umbellifers. Pilifer placed lower than the dorsal surface of the base of the proboscis and clothed with scales only. Palpus long, the tip approaching the base of the antenna, segment I short, II long, III short, porrect. Shaft of antenna without stiff sensory cone or cones ventrally at the apex, with the exception of the last three segments in *Homoeo-*

pteryx; in *Oxytenis* the ventral apical cone of the *Agliinae* replaced by a soft forked appendage; cilia of branches directed downward. Thorax woolly. Epiphysis of foretibia long in both sexes, reaching to, or to near, apex of tibia; tarsi without spines, with the exception of the fourth foretarsal segment of the ♀, which has an apical spine on each side; hindtibia with one or two pairs of spurs, usually two, the inner apical spur at least two-thirds the length of the first tarsal segment. Suture separating the parasternum from the episternum of the mesosternite (cf. Nov. Zool. 1922, p. 252) oblique.

Neuration (Pl. xiii. figs. 1, 2, 3): In forewing 4 subcostals, SC¹ from cell or beyond, SC² absent, SC³ a short spur off SC⁴; R¹ from upper angle of cell or from stalk of subcostals; SM¹ anastomosing with SM², its apex being free. In hindwing the precostal a well-developed tubular vein; C and SC separate from near base, but sometimes almost parallel with one another for some distance; cross-vein D¹ obsolescent or obsolete, as in forewing; SM¹ present.

Early stages very distinctive, known of only a few species:

Larvae (Pl. xiii. figs. 4, 5) of a more or less oily, repulsive appearance, resting on the upperside of a leaf with the anterior third turned side- and backwards, and resembling birds' droppings. Earlier instars with six rows of small tubercles bearing minute bristles, the tubercles smaller and fewer in the last stage; meta-thorax enlarged laterally, bearing dorsally on each side an eye-spot; on preanal segment an S-shaped horn with bifid tip.

Food-plants: *Rubiaceae*.

Pupa not in a cocoon, but concealed in a dry leaf of which the margins are more or less drawn together by silken threads. Sheaths of appendages of head and thorax recalling the pupae of *Arsenura*, but only one leg is showing, the foreleg, which is much smaller than the sheath of the proboscis; antenna longer than proboscis (Pl. xiii. fig. 6).

The family is purely tropical American, being distributed from Honduras to South Bolivia, Matto Grosso, and South-East Brazil; not known from Paraguay and Northern Argentina.

Three genera:

- | | |
|---|------------------------|
| 1. SC ¹ of forewing far beyond cell off SC ⁴ | 2 |
| SC ¹ of forewing from cell, SC ² and R ¹ of hindwing stalked | 3. <i>Homoeopteryx</i> |
| 2. Hindwing tailed in both sexes, the tail at R ¹ | 1. <i>Asthenidia</i> |
| Hindwing not tailed, or the short tail at R ¹ | 2. <i>Oxytenis</i> |

1. Genus: *Asthenidia* Westw. (1879).

Phalaena Geometra L., Cramer, *Pap. Exot.* iii. p. 144 (1780).

Phalaena Attacus L., Stoll, *ibid.* Index, p. 175 (1780).

Therinia Hübner, *Verz. bek. Schmett.* p. 290 (1825) (partim); Möschl., *Verh. zool.-bot. Ges. Wien*, p. 682 (1877); Kirby, *Cat. Lep. Het.* p. 715 (1892) (type: *lactucina*).

Phalaena L., Guérin, *Icon. R. Anim.*, Ins. p. 523 (1829-44).

Asthenia Westwood (nec Hübner, 1826), in Jardine, *Nat. Libr.* xxxvii. p. 209 (1841) (type: *podaliriaria*); Guen., *Uran. & Phal.* i. p. 28, ii. p. 23 (1858) (*Asthenia* not a Geometrid, but a Saturnid).

Thrinia (!) Hübn., Herrich-Schäff., *Schmett. Eur.* vi. p. 89 (1856) (belongs to the Saturnians).

Asthenidia Westwood, *Trans. Zool. Soc. Lond.* x. p. 515 (1879) (nom. nov. pro *Asthenia* praeocc.).

Genotypus, *podaliriaria* Westw. (1841).

Hübner defined his genus *Therinia* as follows: "Flügel nur mit anderthalb dunklen Strichen bezeichnet; blassfärbig im Grunde." He placed under this

diagnosis three species : *T. lactucinaria* (= *lactucina*), *T. strigaria*, and *T. sambucaria*, of which the second and third agree with the description, whereas the first does not. Under the first a synonym is put with a question mark ; the insect to which this synonym refers agrees with the diagnosis of the genus (= *Coitus* of Hübner) and is quite different from *lactucina* = *lactucinaria* even as to the family.

Guenée, l.c., clearly stated that *Therinia* was synonymous with *Ourapteryx*, a Geometrid genus, of which the third species under Hübner's *Therinia* is the genotype. This action of Guenée's equals a selection of that third species *sambucaria* as genotype of *Therinia*.

Thirty-five years later Kirby, l.c., disregarding Hübner's diagnosis of the genus and Guenée's explicit statement of the status of *Therinia*, arbitrarily selected *lactucina* as type of *Therinia*, i.e. just that one species which does not agree with Hübner's description. Moreover, he placed without question mark as synonymous under *lactucina* the entirely different *sambucaria* Clerk nec L., a Uraniid.

The *lactucina* of Kirby's Catalogue, therefore, consists of two species belonging to two families, and the selection of this mixture as genotype is not admissible. However, Kirby's action was *ultra vires* anyhow, as Guenée had definitely settled the question of *Therinia* as above. *Therinia* being a synonym of *Ourapteryx* and, therefore, not available for the Saturnioideans we are dealing with, and *Asthenia* being preoccupied, the correct generic name is *Asthenidia* Westw. (1879), with the Brazilian *podaliriaria* as genotype.

♂♀. Third segment of palpus short, concealed in the vestiture. Proboscis rather weak, with large papillae as in *Oxytenis*. Antenna bipectinate to apex in both sexes, the branches shorter in ♀ than in ♂ ; segments of shaft without sensory cone ventrally at apex, but the branches with such a cone at the tip, at least the distal ones ; the branches basal and ventral, curved down, shaft scaled to apex, upperside of branches with numerous bristles, which are very thin. Foretibia with large epiphysis ; mid- and hindtibial spurs cylindrical, scaled to tip, usually two pairs on hindtibia, the proximal pair sometimes obsolete, the longer apical spur reaching to two-thirds of first tarsal segment or beyond ; foretarsus longer than foretibia, hindtarsus shorter than hindtibia, no spines on tarsi excepting the spine at each side of apex of fourth foretarsal segment of ♀, scales of ventral surface of tarsi pointed, lanceolate or spiniform, fifth foretarsal segment of ♀ without scales beneath, densely ciliated instead. Pulvillus large.

Wings alike in the sexes, except that those of the ♀ are a little broader than in the ♂.

No discocellular tuft of raised scales (hindwing often with a minute black dot at lower cell-angle, but the scales composing it not erect) ; hindwing tailed at R¹.

Neuration (Pl. xiii. fig. 1) : Cell of forewing very short (antenna reaching beyond apex of cell), SC¹ and SC² off SC¹ as very short spurs towards apex of wing, tip of SC⁴ bent down, ending in termen ; R¹ off stalk of subcostals, R¹ curved at extreme base, cross-vein D¹ as in hindwing very thin or obsolete. In hindwing precostal present, SM¹ distinct, short.

Colour white or buff, with a few bands or lines across the wings, and usually with marginal spots immediately in front of and behind the tail.

Wing-scales nearly all bidentate, with the exception of the fringes; in *A. buckleyi*, however, the two teeth less thin and rather shorter, with a third, central, tooth or an indication of one in the majority of the broader kind of scales.

♂. Scent-tuft at base of abdomen conspicuous, generally well protruding, or at least easily recognized in the scaling, the tuft of hairs being long. Genitalia most varied in the different species. The clasper proper composed of two different sclerites: a strongly chitinised main sclerite which is produced into two processes, P^v ventral, always long, pointed, often hooked, and P^a, apical, variable in size, sometimes vestigial; on the outer side of these processes a small soft scaled flap, easily overlooked and sometimes absent, corresponding to the dorsal portion of a normal clasper. Manubrium (= saccus) of segment IX, of which the claspers (= valves) are the pleurites, short, broad, rounded. Penis-sheath varying from being slender, with the apex pointed, to being stout, with the apex dilated and variously armed with processes.

♀. The genital armature much less strongly diversified than in the ♂♂, but different in the various species (8 examined); cavity large, the swellings and folds not very prominent as a rule, one species with a long flat median process; aperture in the middle line, usually proximal, in some species more central.

Larva (Pl. xiii. figs. 4, 13, 14): Metathorax enlarged, but not widened into a large lateral flap as in *Oxytenis*, on upperside a kind of ocellus on each side, the two eye-spots connected by a bar. Tubercles of pronotum small, on metanotum a small dorsal double tubercle, a slight protuberance on third abdominal segment, no distinct tubercles on the other segments; tubercles more distinct and more numerous in earlier instars. Sits at rest with a half-turn on the upper side of a leaf.—Food-plant: *Rubiaceae*.

Pupa glossy, antennae reaching to apex of wings (with the exception of *A. buckleyi*?).

Hab. Nicaragua to Bolivia and S.E. Brazil.

Only one species is known from Central America and two from S.E. Brazil, whereas in the Guianas and in Amazonia four or five, if not more, may be met with in the same district. The species seem to occur at lower elevations only.

Asthenia (?) *flavicapilla* Mabille (1879), from Madagascar, is possibly an *Anaphe* according to the description, certainly not an *Asthenidia*.

In the outline of the wings and the colour and markings most of the species of *Asthenidia* bear a remarkably intimate resemblance to a tribe of Old World *Uraniidae* (*Strophidia*, *Micronia*, etc.), and to some white *Geometridae*, such as the Palaearctic *Ourapteryx sambucaria*. Such close similarity between non-related groups of species inhabiting widely separate regions being rare, the present striking instance deserves to be emphasized.

The white species resembling *Ourapteryx sambucaria* in the straight bands which cross the wings are further interesting on account of the great diversity in the genital armature of species which are almost identical in externals, as well as for the strong geographical variation which obtains in these organs in some of the species.

A. Forewing with large black apical patch Species 1.

B. No black apical area. Proximal band of hindwing parallel (or nearly) with the abdominal margin Species 2 to 10.

C. No black apical patch. Proximal band or line of hindwing transverse, almost parallel with termen Species 11 and 12.

1. *Asthenidia podaliriaria* Westw. (1841) (Pl. vi. fig. 8. ♂).

Asthenia podaliriaria Westwood, per Duncan in Jardine, *Nat. Libr. xxxvii, Exot. Moths*, p. 209. tab. 19. fig. 1. ♂ (1841) (Rio de Janeiro); Walk., *Lep. Het. B.M. xxxii*. p. 379 (1865) (Brazil).

Asthenidia podaliriaria Westwood, *Trans. Zool. Soc. Lond. x*. p. 515. tab. 86. fig. 10 (neur.) (1879); Jord., *Nov. Zool. xxx*. tab. 3. fig. 11 (1923) (neurat.).

Therinia podaliriaria Westw., Kirby, *Cat. Lep. Het.* p. 715. no. 7 (1892); *id.*, in Allen's *Nat. Libr., Moths*, iv. p. 63. tab. iii. fig. 1 (1897).

Female not known to us, not described, probably similar to the ♂. Early stages not known.

♂. White. Antenna drab brown. Wings with three narrow drab brown bands, the outer one of them submarginal, on forewing a thin discocellular bar, apex of forewing brownish black above and below. On hindwing the fringe brownish black from costal angle to tail; the black spot in front of tail with an orange spot at the outer margin. No submarginal line on underside.

Proximal pair of spurs of hindtibia much reduced, usually vestigial only, concealed in the scaling of the tibia. In forewing the cell closed, the discocellular D¹ being distinct though very thin, M¹ stalked with R¹, not arising from cell. In hindwing the cell open; SC² stalked with R¹.

♂. Eighth abdominal segment without distinction, the species therein differing much from the other species; the apical margin of the eighth sternite medianly slightly convex (Pl. ix. fig. 1, VIII. st.), feebly chitinised. Tenth tergite (X. t.) very broad, without median process, but the lateral apical angles produced as a blunt cone (Pl. ix. fig. 2). Tenth sternite (X. st.) raised into a prominent transverse ridge which projects laterad and is armed with teeth at the apex of this lateral projection. Anal cone very large (An), strongly chitinised ventrally and laterally, sharply defined. The clasper composed of two processes, P¹ finger-shaped in ventral aspect, but pointed if viewed from the side (Pl. ix. fig. 3); process P² broad from base to beyond middle, here abruptly narrowed and sinuate, the apex compressed, twisted, sharply pointed, and curved upward; flap Cl absent. Penis-sheath (Pen) thin, with small apical hook.

Length of forewing: ♂, 24 to 28 mm.

Hab. S.E. Brazil: Rio de Janeiro, probably more widely distributed.

In the Tring Museum a small series. Also in Mus. Brit. and Mus. Joicey.

2. *Asthenidia amphira* Druce (1890) (Pl. vi. fig. 10. ♂).

Asthenidia amphira Druce, *Proc. Zool. Soc. Lond.* p. 508 (1890) (Intaj, Ecuador).

Therinia amphira Druce, Kirby, *Cat. Lep. Het.* p. 715. no. 3 (1892).

♂♀. The second largest species known, *A. buckleyi* being the largest. As in *A. geometraria* the forewing with a discocellular bar, two discal bands, convergent posteriorly, and a subterminal band, all of a leaden grey colour, without the cinnamon tint which the bands of the allied species have; outer discal band not broken at M¹. Outer band of hindwing broader than in *A. geometraria*, not wavy in the region of the tail; subterminal leaden band of hindwing abbreviated in front of tail, not extending forward to costal angle; tail comparatively long, traversed by a black line (= R¹); fringe from tail to costal angle blackish at base and whitish grey distally.

Blackish scaling on head and legs much reduced. Hindtibia with two pairs of spurs. M¹ of forewing from near angle of cell or from R¹; cell closed in

both wings, but the cross-vein D^1 very thin; SC^1 of hindwing stalked with R^1 ; R^1 ending just below tip of tail, in all the other species at the hindmargin of the tail.

♂. Eighth abdominal sternite (VIII. st., Pl. ix. fig. 4) deeply incurved, not lobate or convex in middle of apical margin. Anal tergite (X. t.) with a median process, which is rather long, slightly spathulate, obtuse (Pl. ix. fig. 5), and with an irregularly triangular, large, acuminate lateral process. Anal cone soft, and therefore quite irregular in shape in dry specimens. Tenth sternite without ridge or lobes. Outer lobe Cl of clasper distinct (Pl. ix. fig. 4); the two inner processes P^1 and P^2 long, P^2 pointed, P^1 obtuse. Penis-sheath (Pen) with a long collar projecting from a penis-funnel (P-F) which is larger than usual; penis-sheath itself (Pl. ix. fig. 6) large, apically divided into two long processes, of which the shorter one is broad, elongate-triangular, the longer one very slender and more than twice the length of the former.

♀. The walls of the genital cavity not strongly chitinated (Pl. xi. fig. 8); aperture (o) proximal, surrounded by irregularly concentric folds, the lateral fold bounding this plicate area extends backwards at each side of middle as a distinct though small ridge, these two ridges slightly diverging posteriorly and disappearing on the smooth, glossy apical area of the sclerite.

Early stages unknown.

Length of forewing: ♂♀, 33 to 40 mm.

Hab. Colombia, Ecuador, Peru, and Bolivia. Evidently confined to moderately high altitudes of the Andes.

In the Tring Museum a series of ♂♂ and one ♀ from: Popayan, Colombia (Lehmann).—Coca, Upper R. Napo, Ecuador, v.-vii. 1899 (W. Goodfellow); Zamora, S.E. Ecuador, 900 to 1,200 m. (O. T. Baron).—Chanchamayo, E. Peru (Schunke); Pozuzo, Huanuco (W. Hoffmanns); Huancabamba, Junin, 1,500 m. (E. Boettger); La Union, La Pampa, and St. Domingo, Carabaya, S.E. Peru, June, July, November, and December, at altitudes from 600 to 1,800 m. (G. R. Ockenden).—Chulumani, Bolivia, 2,000 m., December (Simons), and Yungas de la Paz, Bolivia, November 1899, 1,000 m. (O. Garlepp).

In Mus. Joicey likewise a good series.

In Mus. Brit. three ♂♂ from El Porvenir and Huancabamba, Peru.

3. *Asthenidia transversaria* Druce (1887) (Pl. vi. fig. 2. ♂).

♂. *Asthenidia transversaria* Druce, *Biol. Centr.-Amer., Lep. Het.* i. p. 226. tab. 24. fig. 1 (1887) (Nicaragua, Costa Rica, Panama, Colombia).

Therinia transversaria Druce, Kirby, *Cat. Lep. Het.* p. 715. no. 1 (1892).

♂♀. In colour and markings similar to *A. amphira*, on an average smaller, more chalky white, the bands more cinnamon (i.e. with a yellowish tone), tail shorter and without black line. Spot before tail for the greater part yellow, black spot behind tail large, larger than in the allied species; subterminal drab band of hindwing continued forward as a thin line some distance beyond the antecaudal spot, postmedian band of hindwing broadened in caudal area, marginal line from tail forward much deeper black than in *A. amphira*.

Distinguished from *A. geometraria* by the second discal band of the forewing not being broken at M^2 , the postmedian band of the hindwing being wider and not distinctly dentate in caudal region, by the large antecaudal yellow spot and the

large postcaudal spot, further by the much abbreviated and much thinner subterminal line of the hindwing, the presence of two pairs of spurs on the hindtibia, the more restricted black colouring on the head and legs, and by the widely different genitalia.

Cell closed in both wings, cross-vein D^1 complete though thin; in forewing M^1 from cell-angle or on a short stalk with R^1 ; in hindwing SC^2 and R^1 from a point or separate, not distinctly stalked.

♂. Eighth sternite characteristically modified (Pl. ix. fig. 7, VIII. st.): distally strongly chitinised, depressed, with the apex enlarged anad and the apical margin curved ventrad, a well-defined, rounded glossy lobe being formed which is broader than long. Tenth tergite (Pl. ix. figs. 7-11) divided into two dorso-lateral processes, which are acuminate, in lateral aspect elongate-triangular; at the base of each process, dorsally, there is a rounded hump, geographically variable in size. Tenth sternite without lobe or ridge. Anal cone transverse. Clasper (Pl. ix. figs. 15-18) with two processes, the exterior flap Cl absent; lower process P^2 much the longer, pointed, the tip curved dorsad; the upper process P^1 geographically variable. Penis-sheath (Pl. ix. figs. 12-14) likewise different according to locality, always large, ending with three processes, of which the middle one is broad, triangular, and bears the large aperture.

♀. We have of this sex only one, rather dilapidated, specimen without locality from the Felder collection. Our figure (Pl. xi. fig. 9) of the genital sclerite requires confirmation. Seventh sternite internally strongly chitinised and convex, forming the roof of a large genital cavity. In front of the vaginal aperture (o) a transverse ridge; behind the aperture two nearly parallel, longitudinal ridges as continuations of the lateral edges of the aperture, the space between this pair of ridges very little concave and almost on a level with the ridges; at each side of this narrow raised median triangle a rather deep longitudinal ditch, laterally of which the sclerite is rounded-convex.

Length of forewing: 22 to 34 mm.

Early stages not known.

Hab. Nicaragua to Colombia, in several geographical forms, which differ in the genital armature of the ♂♂ (only one ♀ has been examined).

* (a) *A. transversaria salax* subsp. nov. (Pl. vi. fig. 2, ♂).

A. t. Druce, l.c. (partim).

♂. Dorsal humps of anal tergite (Pl. ix. figs. 7-9) low; upper process P^1 of clasper (Pl. ix. figs. 15, 16) not divided or only with indications of projections; penis-sheath (Pl. ix. fig. 12) with the upper process (on the backside of the aperture) very large, slightly resembling a cricket-bat, but with the offside and apex rounded and the apex denticulate, the second process bearing the aperture much shorter than the third, which is slender and has a few teeth at apex and lower margin.

Hab. Nicaragua; Costa Rica.

In the Tring Museum three ♂♂ from: Rio Wanks, Nicaragua, ix. 1905 (M. G. Palmer); Carreblanco, Costa Rica, type (Lankester), and Costa Rica, ix. 1919.

In Mus. Brit. four ♂♂, one ♀ (without abdomen) from: Chontales, Nicaragua; Cache, Costa Rica; and Costa Rica.

(b) *A. transversaria transversaria* Druce (1887).*Asthenidia transversaria* Druce, l.c. (1887).

♂. Upper process P¹ of clasper shorter than in the previous race, with short apical projections (Pl. ix. fig. 17); longest process of penis-sheath (Pl. ix. fig. 13) much narrower than in *A. t. salax*, and the third process quite short.

Hab. Panama; West Colombia?

In Mus. Tring one ♂ from Chiriqui.

In Mus. Joicey some ♂♂ from Bugaba and Chiriqui; "type" from Chiriqui ex coll. Druce.

In Mus. Brit. seven ♂♂, two ♀♀ from Chiriqui, 2-3,000 ft., Bugaba, 800-1,500 ft., Panama, and "Colombia." The single Colombian ♂, from an old collection, without precise locality, agrees with the present subspecies, not with the next; it probably came from Western Colombia.

(c) *A. transversaria columbiana* subsp. nov.

(?) *Asthenia geometraria* Feld., Weymer, in Stübel, *Reise Süd-Amer.* p. 25. no. 131 (1890) (Villavicencio, Colombia.—Probably this subsp. not *geometraria*).

♂. Dorsal humps of anal tergite much higher than in the previous races, being modified into prominent processes (Pl. ix. figs. 10, 11); lateral processes of this tergite broader. Upper process of clasper (Pl. ix. fig. 18) short, divided into two curved prongs, of which the upper one is united with a third projection, simple or forked, placed on the inner side. Penis-sheath (Pl. ix. fig. 14) nearly as in *A. t. transversaria*, but the upper process comparatively shorter and without teeth at the apex, lower process hooked.

Hab. Colombia.

In Mus. Tring from: Muzo, R. Cantinero, 400 m. (A. H. Fassl), 1 ♂ (type); Bogotá, 1 ♂; and 1 ♀ ex coll. Felder, presumably received from Lindig, Bogotá.

4. *Asthenidia terminalis* spec. nov. (Pl. vi. fig. 3, ♂).

♂. Colour and pattern as in *A. transversaria*, but forewing with a thin black line at the terminal margin itself, the fringe remaining white, the line interrupted at the veins and more or less indistinct towards hind angle. Hindwing as in *A. transversaria*, but the subterminal band much more distinct from the tail forward than in the forms of *transversaria*, postcaudal spot larger than antecaudal one, the yellow portion of the latter smaller than in *transversaria* and of a more ferruginous tint; on tail a brown vein-streak as in *A. amphira*.

Length of forewing: 33 to 35 mm.

Two pairs of spurs on hindtibia. Cell closed in both wings, but D¹ very thin; M¹ of forewing from cell close to angle; SC² and R¹ of hindwing separate or from a point, not stalked.

Eighth sternite (VIII. st., Pl. ix. fig. 19, ♂) most peculiar, bearing a large, somewhat convex, rounded median lobe which is armed at the margin with blunt, tooth-like, projections. Tenth tergite (X. t., Pl. x. fig. 1) likewise distinctive, slightly resembling that of *A. transversaria columbiana*; divided into four obtuse processes of about equal lengths, the processes diverging and recalling the tentacles of a slug. Anal sternite without ridge or lobe. Lower process P¹ of clasper (Pl. x. fig. 2) long, more or less compressed and slightly twisted, ending

with a short, feebly curved, hook ; process P^1 quite short, connected by means of a ridge with another small process which is placed inward of it and a little further back ; at the base of the claspers, concealed by the eighth sternite, there is a smooth erect median sclerite, almost vertical posteriorly, convex anteriorly and rounded transversely, somewhat resembling a quarter of a globe in a ventral aspect (but its longitudinal diameter too short), and representing the ninth sternite (IX. st., Pl. x. fig. 2, lateral aspect). Penis-sheath large, with two pointed apical processes (Pl. x. figs. 3, 4), the shorter one curved dorsad and sinistrolaterad, the other nearly straight.

♀ and early stages not known.

Hab. Ecuador ; Colombia.

In Mus. Tring from : Paramba, N.W. Ecuador, 3,500 ft., iii. 1897 (W. F. H. Rosenberg), ♂, type, another ♂ from the same place, without name of collector, and a third from R. Dagua, W. Colombia (W. F. H. Rosenberg).

In coll. Paul Dognin 1 ♂ from Ecuador, probably Ambato.

5. *Asthenidia geometraria* Feld. (1862) (Pl. vi. fig. 9).

♀. *Asthenia geometraria* Felder, *Wien. Ent. Mon.* vi. p. 188. no. 177 (1862) (R. Negro) ; iid., *Reise Novara, Lep.* p. 2. tab. 92. fig. 2 (1874).

Therinia geometraria Feld., Kirby, *Cat. Lep. Het.* p. 715, no. 6 (1892).

♂♀. One pair of spurs on hindtibia. White, with the usual blackish brown colouring on frons, palpus, and legs. Bands of wings varying from wood-brown to sepia-brown, three on both wings, the third subterminal, close to margin but separate from it ; on forewing a discocellular bar of the same colour, first band of forewing the broadest, 1 to 1.5 mm. wide, straight, oblique, running from about middle of costal margin to three-fourths of posterior margin, second band commencing at three-fourths of costa, less oblique than the first, broken upon M^1 . First band of hindwing nearly parallel with abdominal margin, second curved in middle and here widened and irregularly zigzag or dentate, fringe black from tail to costal angle, antecaudal black spot with ferruginous outer dot. Underside white, costal margin of forewing cinnamomeous drab, this colouring fading away distally.

♂. Eighth sternite (Pl. x. fig. 7) well chitinated, with a broad, truncate-rotundate, median lobe, which varies in size, is widest apically, and usually has the angles subacuminate (we have drawn the lobe separately, as it conceals too much of the claspers) ; its dorsal surface transversely ribbed. Tenth tergite truncate-rotundate, dorsally hardly at all projecting (Pl. x. figs. 5, 6, X. t.), but far down the sides with a very long and slender process, which is pointed and slightly curved inward, the two processes far apart (Pl. x. fig. 6), and curved like a pair of round brackets, but less strongly so, in a lateral view almost straight, with the tip usually bent down (Pl. x. fig. 5). Anal cone large, long, ventrally rather strongly chitinated. Tenth sternite without ridge or lobes. Clasper with two very long, slender processes, in a ventral aspect these processes together with the penis-sheath and the two processes of the anal tergite look like a bundle of swords ; lower process P^2 compressed, much broader in a lateral view (Pl. x. fig. 5) than when seen from below, its apex pointed and curved upwards, the base gradually swelling out, its ventral surface convex ; upper process P^1 very slender, shorter than P^2 . All these processes vary to some extent. Penis-sheath (Pen)

large, long, distally compressed, the apex entire and rounded (in a lateral view, Pl. x. fig. 5).

♀. Genital cavity smooth, without prominent ridges; from the orifice side-wards extends a median belt which is more strongly chitinated (Pl. xi. fig. 7).

Larva unknown. Pupa-shell (in coll. A. M. Moss) pale clay-colour.

Length of forewing: ♂♀, 24 to 33 mm.

Hab. The Guianas, Amazonia, Peru, Matto Grosso; probably also Bolivia, Ecuador, and Colombia, but we have not seen specimens from these countries.

In the Tring Museum a series of both sexes from: Surinam, French and British Guiana, Pará, R. Madeira, R. Negro (type, ex coll. Felder), East and South-East Peru (Pozuzo, Chanchamayo, Carabaya), Matto Grosso.

In Mus. Joicey likewise a series.

In us. Brit. eight ♂♂ from Venezuela and British Guiana.

6. *Asthenidia celata* spec. nov. (Pl. vi. fig. 5. ♀).

Asthenidia geometraria Feld., Druce, *Biol. Centr.-Amer., Lep. Het.* i. p. 226 (1887) (Ecuador).

♂♀. In colour and pattern almost identical with *A. geometraria*; the bands of both wings rather thinner, particularly the second; this band on the forewing much less distinctly broken at M², sometimes not broken, and on hindwing more regularly scalloped before middle; an indication of a brown marginal line from postcaudal spot towards anal angle. Hindtibia with two pairs of spurs (in *A. geometraria* one pair), and the cell of the hindwing closed, cross-vein D¹ being complete though very thin. Genitalia quite different:

♂. Eighth sternite simple, slightly incurved, without lobe, feebly chitinated (VIII. st., Pl. x. fig. 8). Anal tergite with two long dorsal processes, which point downwards and are compressed, their transverse diameter much shorter than the vertical one (cf. dorsal and lateral views, Pl. x. figs. 9, 11). Anal sternite without armature. Anal cone very large, strongly chitinated dorsally in roof-shape. Clasper with two processes, the lower one, P², broad, compressed, sinuate below tip, with the upper angle projecting. P¹ quite different from that of any other known species: somewhat resembling a slightly bent arm in a ventral aspect, with the fingers replaced by spines. Penis-sheath very slender (Pen), slightly dilated before apex, with the tip acuminate (Pl. x. fig. 10).

♀. Anterior wall of genital cavity rather strongly chitinated, with a well-raised sharp transverse ridge laterally, in front of this ridge a moderately high swelling; from the vaginal aperture backwards two nearly parallel ridges, which are the edges of an elevated median area and are continuous with the posterior margin of the eighth sternite (Pl. xi. fig. 11).

Early stages not known.

Hab. Amazons; Ecuador.

In Mus. Tring from: Fonteboa, Upper Amazons, ix. 1906 (S. M. Klages), one ♂, two ♀♀.

In Mus. Joicey a ♀ from Sarayaco, Ecuador (Buckley).

7. *Asthenidia paulina* spec. nov.

♀. In colour and pattern like *A. geometraria*, the bands of the only known specimen (which is bad condition) thin, the outer discal band of the forewing more strongly broken at M², the anterior end of the short posterior portion being

more distant from the posterior end of the main portion of the band. Hindtibia with two pairs of spurs as in *A. celata*.

External genital armature (Pl. xi. fig. 10) quite different from that of any other known species; the genital sclerite medianly produced into a very prominent, flat process projecting from the cavity and about twice as long as broad; the apex of the process asymmetrically rounded (in this specimen).

Length of forewing: 32 mm.

Hab. S.E. Brazil.

In Mus. Brit. one ♀ from São Paulo, 750 m., ex coll. F. Dukinfield Jones.

8. *Asthenidia diffissa* spec. nov. (Pl. vi. fig. 6. ♂).

♂♀. Another species with the colour and pattern of *A. geometraria*. Second band of forewing not broken at M¹. Inner band of hindwing forked on M¹ and more or less hooked at the end, nearly as in *A. stricturaria*, second band almost of even width from below costa to caudal region, thence thinner and scalloped or undulated, the veins in the band slightly darker in transmitted light than the band; subterminal band as in *A. geometraria*, continued to near costal angle, thin behind tail, from tail forward slightly broader than the subterminal band of the forewing and placed a little farther away from the fringe than even in *A. geometraria*, much farther away than in *A. terminalis* and *A. transversaria*; antecaudal spot somewhat larger than, or about as large as, the postcaudal one, with a ferruginous marginal dot; fringe and extreme edge of wing black or blackish from tail to costal angle. Hindtibia with two pairs of spurs. Cell closed in both wings, but cross-vein D¹ very thin; M¹ of forewing from cell close to angle or from angle; SC² of hindwing stalked with R¹.

♂. The eighth sternite (Pl. xii. figs. 1, 2, 4-6) differs from that of all the known species in being armed with a very long curved pointed process at each side, the processes reaching to the apex of the anal tergite and varying geographically; in the middle between the bases of these processes a hump or projection; the portion of the segment from this hump to the apical margin membranous. Anal tergite broad, divided into two broad dorsal processes (Pl. xii. figs. 2, 3). Anal sternite with neither ridge nor lobe. Clasper with one long process and a short lateral one which appears to correspond to flap Cl of *A. stricturaria*, the process P¹ missing; P² compressed, pointed, the tip curved upwards (Pl. xii, figs. 1, 4). Penis-sheath slender, ending in a long, narrow, sharply pointed, nearly straight apical process.

♀. Genital armature (Pl. xii. fig. 7) characterised by the aperture of the vagina being placed behind a large, rounded, hump.

Length of forewing: ♂♀, 31 to 38 mm.

Early stages not known.

Hab. Ecuador to South-East Peru, in four subspecies differing in the ♂ genitalia.

(a) *A. diffissa diffissa* subsp. onomatotypica.

♂. Processes of eighth sternite with the apex curved ventrad, median tubercle small; process P² of clasper broad, rather strongly curved (Pl. xii. figs. 1, 2, 3).

Hab. Amazons; Ecuador; Northern Peru.

In Mus. Tring from: Teffé, Upper Amazons, x.1897 (M. de Mathan), 1 ♂.

In Mus. Joicey from : Sarayaco, Ecuador (Buckley), 1 ♀; Rentema Falls, Upper Marañon, N. Peru, 1,000 ft. (A. K. E. Pratt), 1 ♂.

(b) *A. diffissa fortis* subsp. nov.

♂. Processes of eighth sternite longer than in the other races of the species, curved sideways and up, not down, median tubercle small; process P¹ of clasper nearly as above, but less curved (Pl. xii. fig. 4).

Whether there are differences between the races also in the ♀♀ we do not know, as we have no specimens of this sex of races *a* and *c*.

Hab. Central East Peru.

In Mus. Tring from : La Merced, Chanchamayo (type), 1 pair, "Peru" (probably from the department of Junin or Huanuco), 1 ♂, and 1 ♀ without locality.

(c) *A. diffissa inca* subsp. nov.

♂. Processes of eighth sternite nearly as in *A. d. diffissa*, but more strongly curved, median tubercle very much higher, having developed into a conical process which inclines anad; process P² of clasper narrower than in the two previous subspecies, the apical hook less abrupt (Pl. xii. fig. 5).

Hab. Southern East Peru.

In Mus. Tring from : Cajon, Cuzco, xi. 1890 (Garlepp), 1 ♂.

(d) *A. diffissa tridens* subsp. nov.

♂. Processes of eighth sternite more strongly curved than in *A. d. inca* and somewhat twisted; median tubercle replaced by a long process which reaches well in between the processes P² of the claspers, being about three times as long as in *A. d. inca*; P² as in *A. d. diffissa* (Pl. xii. fig. 6). Postcaudal spot a little larger than antecaudal one.

Hab. South-East Peru.

In coll. Paul Dognin 1 ♂ from R. Yahuar Mayo, Carabaya, 1,200 ft., iv. 1912.

9. *Asthenidia stricturaria* Hübn. (1825).

♂. *Therinia stricturaria* Hübner, *Zutr. Samml. Exot. Schmett.* 3. p. 36. no. 284. figs. 567, 568 (1825) ("Java" error); Kirby, *Cat. Lep. Het.* p. 715. no. 5 (1892) (Pará).

♂. *Phalaena machaonaria* Guérin, *Icon. R. Anim., Ins.* p. 523. tab. 90. fig. 1 (1829-44) (Colombia). *Asthenia machaonaria* Guér., Duncan, in Jardine, *Nat. Libr.* xxxvii. p. 210 (1841); Walk., *Lep. Het. B.M.* xxxii. p. 379 (1865) (Pará).

Asthenia stricturaria (!) Hübn., Walker, *L.c.* xxxv. p. 1919 (1866) (= *machaonaria*).

Thrinia (!) *strigaria* (!) Hübn., Herrich-Schäffer, *Schmett. Eur.* vi. p. 89 (1856).

Therinia machaonaria Guér., Möschler, *Verh. zool.-bot. Ges. Wien*, p. 682 (1877) (Surinam).

♂♀. White, forewing with three bands, the proximal one corresponding to the discocellular bar of the other white species, complete from costal to hind margin, second band parallel to the first, third converging with second posteriorly, commencing at costal margin or below it halfway between second band and apex of wing, no subterminal line, but fringe blackish brown, as it is on hindwing between costal angle and tail. On hindwing three bands, the first a continuation of the proximal band of the forewing, converging with the abdominal margin, which it does not reach, ending at M¹, where it is curved basad, usually an outward tooth before M¹; second band a mere line, crenulate or zigzag in posterior half and here approximated to the third band, which is parallel to the termen, being

rounded-elbowed in the region of the tail, from anal angle to anterior marginal spot (or a little farther forward) a subterminal band; black antecaudal spot with a hazel dot on the proximal side, not at the outer margin. Cf. Pl. vi. fig. 7.

On underside often a distinct line corresponding to the submarginal line of species Nos. 11 and 12; usually some diffuse brownish subterminal scaling from tail backwards. Cell open in both wings, in forewing cross-vein D^1 present as a small spur off R^1 , the spur continued for some distance as a longitudinal fold in the cell, M^1 from cell; in hindwing D^1 absent, SC^2 stalked with R^1 . Hindtibia with two pairs of spurs.

♂. Eighth sternite well chitinised, large, extending far up the sides of the body, its upper apical angle a short, but distinct, free, hard lobe, ventral surface convex, the sclerite rather far distant from the bases of the claspers, the sternite forming the roof of a large cavity, margin of sternite deeply incurved, minutely denticulate. Anal tergite with a median process (Pl. xi. fig. 5) which is about twice as long as broad, its upper surface but moderately convex, the apex with a small sinus or entire. Anal sternite (X. st., Pl. xi. fig. 4) with two rather long contiguous lobes, thick, not strongly chitinised, with the apex slightly sinuate. Outer flap Cl of clasper present; process P^2 large, narrowed from beyond middle, widened again at apex, the apical portion compressed, apex sinuate, with the upper projection pointed and the lower rounded; upper process P^1 finger-shaped, its outer surface convex, inner surface somewhat concave and pilose; in front of the claspers a smooth, transverse, semi-erect, and almost semicircular sclerite (IX. st.), part of the ninth sternite. Penis-sheath (Pen) very slender, rather strongly curved twice, with a short, pointed, apical projection.

♀. We have at Tring only one very much battered specimen, the abdomen of which is not well enough preserved for a description of the genital armature.

Length of forewing: ♂♀, 26 to 33 mm.

Early stages not known.

Hab. The Guianas and Amazonia.

In the Tring Museum a series of ♂♂ and 1 bad ♀: from Surinam, French and British Guiana, Pará, and Teffé. The ♀ mentioned by Felder in *Wien. Ent. Mon.* vi. p. 188 sub no. 177 (1862) is no longer in the Felder collection.

Also in Mus. Joicey and Mus. Brit., both sexes.

10. *Asthenidia spinicauda* spec. nov. (Pl. vi. fig. 7. ♂).

♂. Among our ♂♂ from French Guiana there are seven in which the eighth abdominal tergite has not the simple margin of the preceding species, but bears at each side a marginal projection which is very sharply pointed, the apical portion of the projection being spiniform. I cannot find any other difference from *A. stricturaria*. This may be a case of dimorphism, but such a clear-cut dimorphism in the tail-end would be an exception among Lepidoptera (only *Papilio xuthus* is known to differ slightly in the tail-ends of the seasonal forms) that I prefer for the present to look upon the difference as specific.

Hab. French Guiana; Amazonia.

In Mus. Tring from: St. Jean and St. Laurent, Maroni R., French Guiana, 7 ♂♂ (received from E. Le Moulton), also a ♂ without locality in the Felder collection.

In coll. Paul Dognin 1 ♂ from R. Maues, Amazonas.

11. *Asthenidia lactucina* Cram. (1780) (Pl. vi. fig. 1).

♂♀. *Phalaena Geometra lactucina* Cramer, *Pap. Exot.* iii. p. 144. tab. 273. fig. B, C. ♂ (1780) (Surinam, ♂♀).

Phalaena Attacus lactucina Cram., Stoll, in Cramer, *l.c.* Index, p. 175 (1780).

Therinia lactucinararia Hübner, *Verz. bek. Schmett.* p. 290. no. 2818 (1825) (nec synon.).

Asthenia lactucina Cram., Duncan, in Jardine, *Nat. Libr. xxxii. Exot. Moths*, p. 211 (1841) (Surinam);

Walk., *Lep. Het. B.M.* xxxii. p. 379 (1865) (Surinam, Pará); Butl., *Trans. Ent. Soc. Lond.* p. 77.

no. 144 (1878) (R. Madeira); Dognin, *Lép. Loja*, ii. p. 40 (1891) (Loja, Ecuador).

Thrinia (!) *lactucinararia* Hübner, Herrich-Schäff., *Schmett. Europ.* vi. p. 89 (1856).

Therinia lactucina Cram., Möschler, *Verh. zool.-bot. Ges. Wien*, p. 682 (1877) (Surinam); Kirby,

Cat. Lep. Het. p. 715. no. 4 (1892) (nec synon.); id., in Allen's *Nat. Libr., Moths*, iv. p. 63 (1897).

Evidently the commonest species of the genus.

♂♀. Creamy white, often buffish, rarely chalky white without a buff tone. Face brown from the apex of the palpi to beyond the antennae, the dark colour extending around the eyes; palpus except underside, upperside of foretibia except a basal spot and a median one, two spots on midtibia, and tarsal segments I and V dark purplish brown. Upperside of wings with dark cinnamon markings which are more or less shaded with fawn: on forewing a thin discocellular bar, sometimes interrupted, a little before or beyond middle a nearly straight band, usually less than 1 mm. broad, occasionally crenulated, on disc a crenulated or wavy line, in most specimens accompanied on outer side by a diffuse shadowy band, outer half of wing, sometimes the whole wing, irrorated with brown specks. The lines of forewing continued across hindwing, terminal area irrorated, a small discocellular dot, fringe from tail to costal angle blackish brown; in front of tail a largish black spot, chocolate colour in middle, behind tail two smaller spots, the posterior one of them minute, often vestigial, rarely absent.

Underside likewise irrorated with brown on the forewing and in the terminal area of the hindwing; a submarginal line dark brown, nearly parallel to termen of wings, commencing at costal margin of forewing close to apex.

The irroration of the wings distinguishes this species at a glance. Cell open in both wings, D¹ being interrupted on forewing, or vestigial in middle, absent or barely indicated on hindwing, M¹ of forewing from before apex of cell, SC² of hindwing stalked with R¹. Hindtibia with two pairs of spurs.

♂. Eighth sternite (Pl. x. fig. 12) resembling that of *A. geometraria*, being produced into a large, individually variable, median lobe which is widest at the apex and truncate or rounded with the angles distinct and the sides incurved; on the dorsal side the lobe not ribbed as in *A. geometraria*. Tenth tergite (X. t.) broad, about as long as it is wide at its junction with the ninth tergite (Pl. x. fig. 13), divided by a narrow triangular sinus into two short, broad, rounded lobes of somewhat variable length. Anal cone small. Tenth sternite (X. st.) raised into a somewhat inflated ridge which is divided into four humps or short processes, the median sinus the deepest one, the two middle humps obtuse and less chitinised than the lateral ones, which are more or less pointed. Lower process P⁴ of clasper broad at base, apically claw-like, upper process P¹ broad, obtuse, at the outside of P⁴ the small flap Cl. Penis-sheath (Pen) quite slender.

♀. Genital sclerite proximally deeply concave, the aperture in this groove; behind the groove on each side two transverse ridges united medianly in arc-shape, the anterior ridge the higher; further frontad at the sides another ridge which becomes visible when the apical portion of the seventh sternite is turned over (Pl. xii. fig. 8).

Length of forewing : ♂♀, 27 to 34 mm.

Larva (Pl. xiii. fig. 4) green, on metanotum a clayish brown transverse bar which terminates at the sides with a small black ocellus, another bar on segment X, tapering laterally, tail and anal segment brown, from tail down a white line which runs along abdomen above the legs. Pupa shell black-brown (bred by A. M. Moss at Pará).—Foodplant: *Oourouparia guianensis*.

Hab. Venezuela, the Guianas, Amazonia, Ecuador southwards to Bolivia, Paraguay, and Matto Grosso.

In the Mus. Tring a series from : La Union and La Vuelta, Caura R., Orinoco, v. vi. 1903, Venezuela (S. M. Klages).—British Guiana ; Maroni R. and Kourou R., French Guiana, vii. ix. 1905 (E. Le Moult), also Cayenne ; Aroewarwa Creek, Maroewym Valley, Surinam, ii.–iv. 1905 (S. M. Klages), also old specimens from Surinam, among them a ♂ ex coll. Lennep, which does not agree with Cramer's figure.—Pará (A. M. Moss) ; Humayta, R. Madeira, vii.–ix. 1906 (W. Hoffmanns) ; Tefé, vi. 1906 (W. Hoffmanns) ; Pebas, xi. 1906 (M. de Mathan) ; Fonteboa, v. 1906, viii. 1907 (S. M. Klages).—Zamora, Ecuador (O. T. Baron).—Pozuzo, Huanuco, 800–1,000 m. (W. Hoffmanns) ; Cuzco, iii. 1901 (Garlepp) ; Yahuar Mayo, S.E. Peru, iii. 1912, 1,200 ft. (Watkins) ; various places in Carabaya, S.E. Peru, at 3,100 ft. and 3,400 ft., i. iii. iv. viii. ix. xii. (G. R. Ockenden).—Salampioni, 800 m., viii., San Ernesto, 1,000 m., viii. ix., Charaplaya, 1,300 m., i., all in Bolivia (P. O. Simons), Yungas de la Paz, 1,000 m., x., and Yungas de Coroico, 1,800 m. (Garlepp), Buenavista, East Bolivia, vii.–x. (J. Steinbach).—Cuyabá, Matto Grosso (received from Paul Zobrys).

In Mus. Joicey also a series.

In Mus. Brit. 6 ♂♂, 2 ♀♀ from Brit. Guiana, Amazonas, Peru, and Paraguay.

12. *Asthenidia buckleyi* Druce (1890). (Pl. vi. fig. 4. ♀).

♂. *Asthenidia buckleyi* Druce, *Proc. Zool. Soc. Lond.* p. 507 (1890) (Bolivia ; E. Peru).

Therinia buckleyi Druce, Kirby, *Cat. Lep. Het.* p. 715. no. 2 (1892).

♂♀. The largest species of the genus. Wings and body pale buff yellow or cream-colour ; head black or drab brown, yellow or creamy anteriorly as far as covered by the palpi ; upperside of tarsi and of fore- and midtibiae black or dark brown, spotted or irrorated with cream-colour ; palpus blackish at side ; scaling of hindtibia near spurs the same dark colour irrorated with light scaling.

Wings, on upperside, with two cinnamon bands varying much in width and distinctness, the proximal one postmedian on forewing, nearly straight, almost at right angles to hindmargin, often absent or vestigial, on hindwing this band median and slightly curved, occasionally absent ; distal band submarginal, on forewing usually single and often very indistinct, on hindwing usually double and more distinct.

On underside a submarginal line or band on both wings, almost parallel to termen on hindwing and more or less elbowed at R¹, sepia brown to cinnamon.

Cell open in both wings, D¹ being represented by a longitudinal rudimentary vein or fold which is often very indistinct and curves down distally to join R¹ on the forewing and the stalk of M¹–R¹ on the hindwing, M¹ of forewing arising from the cell ; SC¹ and R¹ of hindwing stalked together. Two pairs of spurs on hindtibia.

♂. Eighth sternite medianly produced and broadly rounded (VIII. st.,

Pl. xi. fig. 1). Tenth tergite (Pl. xi. fig. 2) long, triangular, apically cleft, the incision quite narrow and the lobes formed about twice as long as they are broad proximally. Anal cone comparatively small. Tenth sternite raised into a broad swollen ridge medianly divided by a narrow sinus, the exposed ventral surface densely granulose. Outer flap Cl of clasper present, small, closely applied to the basal portion of the upper process P¹, this broad, widest in a view from the side, obtuse, its ventral surface flattened in distal half and somewhat concave, lower process P² broad in basal half, abruptly narrowed on the inner side, apical portion first slightly widened and then gradually narrowed to a point and curved. Penis-sheath peculiar, gradually widened distally, then again narrowed, curved, the apical portion bent down, forming a long, pointed, and somewhat twisted process which is directed frontad.

♀. Genital aperture proximal (Pl. xii. fig. 9), in a cavity which is partly roofed over by a long, smooth transverse ridge of the seventh sternite; behind the cavity at each side a large swelling raised into a well-marked hump; at the median side of this hump a circular groove, the edges of which are sharp, the median edge forming a short, oblique, longitudinal carina, the middle line of the sclerite in between the humps impressed.

Larva not known. Pupa shell more glossy than in *A. lactucina*, paler, the minutely denticulate carinate apical belts of the middle segments of the abdomen narrower (in coll. A. M. Moss, from Pará).

Length of forewing : 37 to 46 mm.

Hab. Colombia, the Guianas, Amazonia, Ecuador, Peru, Bolivia.

Two subspecies, differing in the pattern :

(a) *A. buckleyi buckleyi* Druce (1890) (Pl. vi. fig. 4. ♀).

♂. *Asthenidia buckleyi* Druce, l.c. (Bolivia; E. Peru).

♂♀. Submarginal line on underside thin, at the most 1 mm. wide on forewing, thinner on hindwing and here occasionally vestigial or even absent.

Hab. Colombia southward to Bolivia, the Guianas (presumably also Venezuela), Middle Amazonas (presumably also Upper Amazonas).

In Mus. Tring a series of ♂♂ and three ♀♀ from : Muzo, Colombia, ix. 1903 (Mathan); British Guiana; mouth of Kourou R., French Guiana, x. 1905 (E. Le Mout); Chanchamayo, E. Peru (A. M. Moss); various places in Carabaya, S.E. Peru, 2,000–3,400 ft., i. viii. ix. xii. (G. R. Ockenden); Bolivia (from Staudinger, coll. by Garlepp); Buenavista, 750 m., viii.–iv., Bellavista, 1,400 m., ix., and Prov. Sara, Depart. de Sta. Cruz de la Sierra, ii.–vi. 1904, Bolivia (J. Steinbach).

In Mus. Joicey from : Mapiri, Bolivia; Rio Napo, Ecuador; Maroni R., French Guiana.

In Mus. Brit. 2 ♂♂ from Bogotá and Yahuar Mayo, Peru.

(b) *A. buckleyi paraensis* subsp. nov.

♂. Submarginal line of underside about 3 mm. wide in middle on forewing, where it is broadest, 2 mm. or less in middle of hindwing, on both wings very much more conspicuous than in the previous race.

Hab. Lower Amazonas.

In coll. A. Miles Moss 4 ♂♂ from Pará, of which the type and another specimen have very kindly been presented to the Tring Museum.

2. Genus : *Oxytenis* Hübner. (1820).

Phalaena Attacus L., Cramer, *Pap. Exot.* i. p. 61 (1775) (partim).

Bombyx, Fabricius, *Ent. Syst.* iii. 1. p. 418 (1793) (partim).

Syssaura Hübner, *Verz. bek. Schmett.* p. 150 (1820) (partim); Herr.-Sch., *Schmett. Eur.* vi. p. 89 (1856); id., *Aussereur. Schmett.* p. 9 (1856).

Oxytenis Hübner, *l.c.* (1820) (partim); Walk., *Lep. Hel. B.M.* v. p. 1181 (1855); Kirby, *Cat. Lep. Hel.* p. 770 (1892) (*modestia* selected as genotype); Pack., *Monogr. Bomb. Moths*, iii. p. 269 (1914) (partim; descript. & fig. of neurat. evidently taken from some other Saturnian, not an *Oxytenis*).

♂. *Draconipteris* Hübner, *l.c.* (1860) (partim); Walk., *l.c.* p. 1185 (1855); Kirby, *l.c.* p. 764 (1892) (*mirabilis* designated as genotype); Pack., *l.c.* p. 271 (1914).

♂. *Teratopteris* Hübner, *l.c.* p. 151 (1820) (one species, *angulata*); Walk., *l.c.* p. 1184 (1855); Möschl., *Verh. zool.-bot. Ges.* p. 679 (1877) ("belongs to the Saturnians"); Kirby, *l.c.* p. 764 (1892); Pack., *l.c.* (1914).

♂. *Lycabis* Doumet, *Rev. Zool.* (2). xi. p. 263 (1859) (type: *bimaculatus* = ♂ *modestia*); Kirby *l.c.* p. 803 (1892).

Asthenia Westw., Felder, *Wien. Ent. Mon.* vi. p. 189 (1862) ("The species of *Teratopteris*, *Draconipteris*, and *Oxytenis* should be included in *Asthenia*").

♂. *Eusyssaura* Packard, *Journ. N.Y. Ent. Soc.* xi. p. 246 (1903) (type: *honesta* = ♂ *modestia*); id., *Monogr. Bomb. Moths*, iii. p. 269 (1914) (partim).

Though in general aspect, especially in colouring, very different from *Asthenidia*, the present genus closely agrees with it in the structure of the wings and the early stages. The Felders' remark quoted above in the synonymy under *Asthenia* reveals a remarkable insight in the true relationship of these moths.

The name *Syssaura* was proposed by Hübner (1820) for a mixture of five species, of which two are Drepanids (*falcula* = *falcataria* and *sicula* = *curvatula*), two Saturniids (*zebrina* and *honesta*), and one a Geometrid (*drepanula*). Stephens, in 1834, applied the name *Syssaura* Hübner to the section A of *Drepana*, placing in this section one species, *falcataria*. Most subsequent authors appear to have followed Stephens in associating the name *Syssaura* with the *Drepanidae*. Herrich-Schäffer, however, twenty-two years later, reserved *Syssaura* for the Saturnians, placing in it "*honesta* und viele andere."

We consider Stephens's action quite legitimate; but in order to set at rest any doubt about the application of the name *Syssaura*, we designate *falcataria* = *falcula* Hübner, *Eur. Schmett.* ii. Bomb. fig. 44, as genotype, there being to our knowledge no contrary prior definite selection of a genotype for *Syssaura* Hübner. (1820).

The name next in priority is *Oxytenis* Hübner. (1820). Kirby selected *modestia* as genotype from among the three species included in it by Hübner. This selection is valid.

The later names *Lycabis* and *Eusyssaura* were both proposed for ♂♂ of this same *modestia* (usually misspelt *modesta*).

Draconipteris Hübner. (1820) and *Teratopteris* Hübner. (1820) are based on ♂♂ in which the termen of the wings is sinuate or angulate. Such differences do not justify generic separation, because (1) there are wing-contours intermediate between the extremes, and (2) there is nothing in the ♀♀ to support a division based on the shape of the ♂-wings. We therefore sink both *Draconipteris* and *Teratopteris* as synonyms of *Oxytenis*.

In both sexes of *Oxytenis* the wings have above, and usually also below, a tuft of erect scales at the lower angle of the cell. Termen of wings always entire in ♀; in ♂ it is entire, or dentate, or lobate, and in the hindwing often short-

tailed, the tail being a prolongation of the angle between R^1 and R^2 , not as in *Asthenidia* between R^1 and R^2 ; SC^2 of hindwing from cell.

Proboscis distinct; as in *Asthenidia* with numerous large carinate papillae, the carinae of which usually end with spiniform projections. Antennae not reaching cell-apex; the shaft scaled to apex; branches ventral, curving ventrad from origin, arising at the bases of the segments, one on each side; proximal segments a little broader than long, distal ones longer, sometimes about twice as long as broad, usually but a little longer than broad in a ventral aspect; apices of segments in distal half of antennae more or less elevate ventrally, a small tubercle being formed which projects ventrad-distad and bears a soft, longish, cone, generally split into two or three prongs; no stiff bristles on shaft, but the branches with an apical bristle and one or two dorsal ones, on the distal branches sometimes a few more thin bristles hardly thicker than the ventral cilia; branches shorter in ♀ than in ♂, but even in ♀ at least as long as two segments of the shaft, in the ♀♀ of several species apically dilated and studded on the flattened apical surface with minute cilia (Pl. xiii. figs. 13-19).

Neuration (Pl. xiii. fig. 2) similar to that of *Asthenidia*; cell as short as in that genus, but broader in both wings; in forewing the upper angle of cell obtuse or rectangular, SC^1 from far beyond cell, R^1 from stalk of subcostals, SC^2 nearer to cell than SC^1 , SM^1 anastomosing with SM^2 , M^1 from cell; in hindwing the precostal distinct, SC^2 from cell, not stalked with R^1 , cross-vein D^1 as in forewing very thin, M^1 from cell, SM^1 present, though short and thin.

♂. At base of abdomen of ♂ a lateral scent-tuft of long radiating hairs, usually concealed under the woolly vestiture; we have not observed it in all the species, there being possibly some in which the organ is obliterated. Eighth abdominal sternite (cf. Pl. xiv.-xviii.) rather strongly chitinised, truncate or sinuate, the angles not produced in *O. modestia*, in all the others produced as a lobe or pointed horn. Anal tergite broad, truncate (*O. modestia*) or bilobate; no anal sternite. The clasper consists of a large ventral sclerite (harpe, H) ending with a beak-like process, and of a broader, feebler chitinised dorsal flap (valve, Cl) which is longer than the harpe, concave on the inner side, and more strongly chitinised at the dorsal margin than ventrally. Penis-sheath different in the various species, but always has a rod-like, somewhat tapering, process attached to its base, the sheath bearing a small impression where the rod touches it; this guiding rod projects from the dorsally open lumen of the penis-funnel (P-F), in which it slides like a piston in its cylinder; this structure is confined to *Oxytenis*.

♀. The genital armature on the whole simple, but different in each species of which the true ♀ is known; the genital sclerites do not appear to have a feature in common by which the genus as a whole is distinguished from the allied genera.

The small discocellular tuft of oar-shaped erect or semi-erect scales on the upperside of the wings is a feature peculiar to this genus; it is usually more or less distinct also on the underside; it probably serves to enhance the similarity of the imago at rest to a dry leaf.

Larva (Pl. xiii. figs. 5, 11, 13): early instars resembling birds' droppings, of an oily, offensive aspect, last stage very snake-like; at rest the anterior portion of the body curved sideways and backwards and lying close to the abdomen. Metathorax strongly widened on each side into a sort of broad lobe, above each lobe a luniform ocellus; all segments, at least in the earlier stages, with a trans-

verse row of four tubercles, two on each side; the dorsal tubercles of segment XI forming the bifid tip of the S-shaped tail.

In *O. naemia*, of which my friend the Rev. A. J. Miles Moss, of Pará, has given me a dried larva in the last but one instar, the prothoracic tubercles are the largest (Pl. xiii. fig. 11); in front of the prothoracic stigma a small tubercle, and a similar one on the mesothorax, whereas the corresponding tubercle of the metathorax is larger and placed at the apex of the lateral expansion of the segment; on first abdominal segment a minute tubercle below stigma; all the dorsal and dorso-lateral tubercles, as well as the lateral metathoracic one, bear a peculiar black process, the homologon of a spine, about twice or thrice as long as wide, narrowed at the base, the apex truncate or obliquely acuminate, not sharply pointed, this obtuse spine probably tumid in life; the dorsal and dorso-lateral thoracic tubercles with two such spines, the other tubercles with one. The tubercles, as well as a great portion of the surface of the body, bear small pustules crowned with a very short thin spine which is rounded-enlarged at the tip. Tail fairly long, with a joint in it, movable, the basal portion being a swelling of the eleventh segment, and the apical portion corresponding to the combined two dorsal tubercles of the other abdominal segments; the four tubercles behind the tail pointed and rather larger than the other abdominal ones; anal flap with two tubercles. Opposite the claw of the thoracic tarsi a pair of blackish, strongly chitinated, bifid, flattened spines (Pl. xiii. fig. 13).

Food-plants: *Rubiaceae*.

Pupa coriaceous, somewhat glossy; antenna shorter than in *Asthenidia*, falling far short of the apex of the wing-cases; foreleg broader and longer than in *Asthenidia*, more than half the length of the proboscis; bases of abdominal segments V, VI, VII dorsally as far down as the stigmata, densely carinulate and punctate; cremaster with involute spines (Pl. xiii. fig. 6, 8).

Hab. Honduras to Bolivia, eastward to S.E. Brazil and Pará; 17 species, of 7 the ♂ only being known.

A very interesting feature of the present genus is the strong sexual dimorphism which obtains in nearly every species in the contour and colouring of the wings. It is further worthy of note that quite a number of species are distinguishable with certainty only by the genitalia, which have been compared in very specimen in the Tring Museum as well as in those lent to us.

1. *Oxytenis modestia* Cram. (1780) (Pl. vii. fig. 8. ♂, 12. ♀).

♀. *Phalaena Attacus modestia* Cramer, *Pap. Exot.* iii. p. 143. tab. 272. figs. C.D (1780) (Surinam); id., Index, p. 175 (1780).

Phalaena Attacus modesta (!), id., l.c. French text (1780).

♂. *Phalaena Attacus honesta* id., l.c. iv. p. 25. tab. 302. figs. C.D (1780) (Surinam).

♂. *Syssaura honesta* Cram., Hübner, *Verz. bek. Schmett.* p. 150. no. 1575 (1820).

♀. *Oxytenis modestia* Cram., id., l.c. no. 1578 (1820).

♂. *Oxytenis honesta* Cram., Walker, *Lep. Het. B.M.* v. p. 1182. no. 2 (1855); Druce, *Biol. Centr.-Amer., Lep. Het.* i. p. 198. no. 1 (1886) (Nicaragua, Chiriqui, Ecuador, Peru, Surinam, Pará); Kirby, *Cat. Lep. Het.* p. 170. no. 2 (1892); Druce, l.c. ii. p. 427 (1897) (Brit. Honduras; Honduras).

♀. *Oxytenis modesta* (!) Cram., Walker, l.c. v. p. 1183. no. 3 (1855); Kirby, l.c. no. 3 (1892).

♂. *Lycabís bimaculatus* Doumet, *Rev. Zool.* (2). xi. p. 263 (1859) (Pará); Kirby, l.c. p. 803 (1892).

♂. *Oxytenis attacina* Walker, l.c. xxxv. p. 1941 (1865) (Bogotá); Kirby, l.c. no. 7 (1892).

♂. *Oxytenis lonomica* Druce, l.c. i. p. 198. no. 2. tab. 21. fig. 1 (1886) (Guatemala; Panama).

♂. *Oxytenis lonomia* (!) Druce, Kirby, l.c. no. 8 (1892).

♂. *Eusysaura honesta* Cram., Packard, *Journ. Ent. Soc. N.Y.* xi. p. 246 (1903); id., *Monogr. Bomb. Moths*, iii. p. 270. tab. 36. fig. 4 (1914) (Nicaragua to Amazons).

A widely distributed and fairly common species, evidently being more frequently met with than any other species of the genus. There is a great deal of individual variability, but the species has apparently not split up into geographical forms, though it is found in very different faunistic districts.

♂. This and *O. albilunulata* are the only species of the genus in which the terminal margins of both wings are entire in both sexes. Colouring variable above and below, markings of upperside sometimes absent or obsolescent, with the exception of the line which runs from the apex of the forewing to the middle of the abdominal margin of the hindwing. In most specimens the upperside paler from line to base than from line to termen, on forewing a discocellular patch, two patches on proximal side of line and a third before tornus deeper brown, the last often blackish; on hindwing a row of discal lunules filled in with scaling about as pale as the basal area.—Underside yellow from base to line, outer area brown, but sometimes the whole of the wings brown, in other cases the distal area pale and much shaded with grey; the line of the hindwing irregularly curved distad in middle.

Eighth abdominal sternite (Pl. xiv. figs. 1–4) simple, very little projecting, apical margin truncate, slightly incurved medianly, rounded at the sides. Tenth tergite broad, with a broad, dorsally somewhat convex, median process, which is either truncate-rotundate at the apex or sinuate, the sinus varying in size, but always small, the two lobes of the sinuate tergite rounded or irregularly truncate. Clasper, in lateral aspect, finger-shaped, slightly narrowed and beyond middle curved, the apical portion subtriangular; harpe forked, its ventral process P^2 long, slender, thorn-like, regularly curved dorsad, the upper process P^1 of the fork shorter, directed dorsad, broad, obtuse, its broad side facing the spiniform process somewhat concave. Penis-sheath stout, widest at the orifice, on the left side rounded-widened from before the elongate orifice to beyond it, on this convex part dorsally two teeth, one larger than the other, apical portion from the orifice distad slightly curved towards the right side, flattened, apex sub-acuminate; from the base of the sheath, ventrally, a slender, straight, cylindrical rod, which reaches to the orifice, its tip blunt. Penis-funnel ventrally sinuate.

♀. Colour of upperside nearest to vinaceous cinnamon (Ridgway, *Nomencl. Colours*, iv. 15), shaded with fawn, usually without blackish brown blotches, line as in ♂, but more tawny, outside the line on forewing more or less distinct blackish lunules edged with white on outer side, the row of lunules continued across hindwing, but here indistinct; no black spots on forewing in front of tornus. At apex of distal branches of antenna a dense patch of minute cilia.—Underside variable as in ♂, as a rule yellow from base to line, the outer area usually not much contrasting, being buff or buffish ochreous shaded with purple brown, sometimes the purple brown scaling dense; line of forewing broader than above, replaced on hindwing by an irregular row of purple-brown uniform blotches, the middle lunule more distal than the two before and the two behind it, the yellow area penetrating distad between R^1 and R^2 as in ♂.—Genital cavity of ♀ (Pl. xviii. fig. 1) large, flanked at each side by a broad elevation, the surface of which is concave; farther towards middle a sharply marked narrow ridge which runs frontad and then becomes transverse, bounding the orifice *o* on the frontal side.

Larva: A. M. Moss obtained at Pará a larva which is probably that of the present species. Green, on metanotum two small dorsal eye-spots, one each side,

consisting of a black pupil surrounded by a pale ring which is white anteriorly and yellowish posteriorly; behind middle a large transverse whitish dorsal patch bearing some brown dots in front and behind; tail blackish brown, in front of tail a large diamond-shaped dorsal area purple-brown, anal segment the same colour; above the legs a white line from below tail forward.

Length of forewing: ♂, 27 to 38 mm.; ♀, 33 to 39 mm.

Hab. From Guatemala to Bolivia and South-East Brazil, presumably occurring also in Mexico and Northern Argentina.

In the Tring Museum a series of both sexes, from: Nicaragua: San Ramon, R. Wanks, 375 ft., vii. 1905 (M. G. Palmer), 1 ♀.—Costa Rica: Tuis (W. Schaus), 1 ♂.—Colombia: Purnio, 280 m., x., xi. 1896 (Dr. Bürger), 1 ♂.—Venezuela: San Esteban, vii. 1909 (S. M. Klages), 12 ♂♂, 1 ♀; Palma Sola, 2 ♂♂; Lower Orinoco, x. 1897 (Cherrie), 1 ♂.—Trinidad: Port of Spain (F. Birch), 1 ♂.—British Guiana: Rio Demerera, Christianburg, and without exact locality, 8 ♂♂, 2 ♀♀.—French Guiana: St. Jean and St. Laurent, Maroni R., vii. viii. xii. 1905 (E. Le Mout), 5 ♂♂, 2 ♀♀.—Surinam: Aroewarwa Creek, Maroewym valley, v. 1905 (S. M. Klages), 3 ♂♂; Onoribo, iii. 1893 (C. W. Ellacombe), 1 ♀.—Amazonia: Pará (A. M. Moss), 3 ♂♂ (in coll. Moss also 3 ♂♂); Fonteboa, v. vii. viii. x. 1907 (S. M. Klages), 6 ♂♂; Teffé, ix. x. 1907, and Pebas, x. 1907 (M. de Mathan), 4 ♀♀; in coll. Felder 1 ♂ collected by Bates, without precise locality; Rio Negro, 1 ♂.—Ecuador: Quevedo, West Ecuador (v. Buchwald), 2 ♂♂; Lita, W. Ec., 3,000 ft. (Flemming), 1 ♂; Coca, Upper R. Napo, v.–vii. 1899 (W. Goodfellow), 1 ♂.—Peru: Chanchamayo (Schuncke), 1 ♂; Cajon, Cuzco, xi. 1900 (Garlepp), 1 ♂.—Bolivia: Buenavista, 750 m., viii. 1906–iv. 1907 (J. Steinbach), 1 ♂, 1 ♀.—E. Brazil: Rio de Janeiro, 2 ♂♂; Miritiba, 1 ♂.

The species evidently is very rare in eastern Peru; Ockenden, who sent very large collections from S.E. Peru, never met with it, and the numerous consignments we have received from the Chanchamayo district contained only one ♂. The chief home of the species seems to be Amazonia and the northern countries of South America.

2. *Oxytenis albilunulata* Schaus (1912) (Pl. vii. fig. 13 ♂, 14 ♀).

♂. *Oxytenis albilunulata* Schaus, *Ann. Mag. N.H.* (8). ix. p. 44 (1912) (Costa Rica).

♂. The outline of the wings almost as in the ♀ of *O. angulata*: termen of both wings entire, rounded, apex of forewing produced, anal angle of hindwing not widened inward as a lobe.

Body and wings above varying from ochraceous to chestnut. On forewing from base of M^1 to middle of hindmargin a dark brown curved line, its posterior section darker, in cell a little beyond this line a brown bar, on discocellulars a diffuse brownish bar, accentuated by a dot of raised scales, and on inner side of oblique line, which is yellowish ochraceous or reddish brown on both wings, a broad shadowy deep brown band which curves costad anteriorly, an admarginal line at apex and the fringe from apex to near middle blackish brown, outside the oblique line a thin crenate line edged with white lunules, a row of subterminal, small, dark brown bars, and usually two minute dashes before tornus.—On hindwing an oblique dark-brown line, 8 mm. from base at abdominal margin, not extending forward beyond cell, converging posteriorly with the median line; on

disc a strongly dentate crenate line, black at abdominal margin, effaced from before middle to costa ; a row of conspicuous black-brown submarginal dots, the last three nearer the crenate line than the others, no dot below costa ; fringe of termen dark brown, with a white line ; wool of abdominal margin creamy buff.

Underside bright buff, distally shaded with ochraceous, in costal area of both wings irrorated with dark brown. On forewing a broad line (about 1 mm. wide), broadest in middle, from apex to hindmargin, distinctly curved posteriorly, blackish brown ; some minute subterminal spots dark brown.—On hindwing a broad blackish brown line, 2.5 mm. wide in the specimen figured, 1.5 in a second specimen, straight across wing or slightly curved, sometimes lunulate, placed about midway between lower angle of cell and termen ; a row of small dark brown subterminal dots, the last two touching the line. Fringe of both wings dark brown.

Genitalia of ♂ (Pl. xiv. figs. 5–11) : Eighth sternite drawn out into a very long slender, sharply pointed process on each side. Anal tergite broad, with a narrow median sinus, the lobes much broader than the sinus and also much broader than long. Setiferous submedian ventral swelling of clasper not drawn out into a process ; hook of harpe slender, with very sharp point, curved inward and dorsad. Penis-sheath strongly curved ventrad ; guiding rod reaching beyond middle of sheath ; orifice apical, extending down on the left side ; on this side no special armature, while on the right side there is a dentate ridge, visible in a ventral view as well as in a view from the right and dorsal sides.

♀. Upperside darker than in ♂, cinnamon shaded with russet and greyish white ; at base of terminal fringe a thin white line (also in ♂), more or less incomplete. On forewing an oblique bar in middle of cell, and from below cell to hindmargin a line curved as in ♂ and reaching hindmargin about at two-fifths, dark brown, a diffuse discocellular bar and nearly halfway to apex a similar bar parallel with the discocellular one pale walnut-brown ; from apex of forewing to three-fifths of abdominal margin of hindwing a nearly straight line about 1 mm. broad, walnut brown with a slight tawny tint, beyond this line on forewing a series of thin, but well-marked, white lunules edged with brown on the proximal side and bounding submarginal patches of a clayish buff tint, of which the outer side is bounded by dark-brown bars, the patches R^1-M^2 nearly circular and much larger than the others, patch M^1-M^2 being much the largest.—On hindwing at nearly equal distances between postcellular line and termen first a diffuse blackish zigzag line, anteriorly nearly simple and straight, then a row of dark brown dots, some of which are more or less anguliform ; anal angle lobate, but less distinctly than in *O. peregrina* ; costal area partly buff as far as covered by forewing.

Underside orange buff, paler towards the base ; from apex of forewing a black-brown thick line, fading away near hindmargin, slightly curved, at M^1 7 mm. from fringe and 12 from cell, a row of four minute dark brown subterminal dots.—On hindwing the submarginal line thicker than on forewing, straight, feebly or more distinctly lunulate, at abdominal margin nearer to the fringe than anteriorly, a subterminal row of dark brown dots as above but more distinct, no dot before subcostal vein, last two dots small and contiguous with the line ; fringe of both wings blackish tawny.

Antenna similar to that of *O. epiphaea*-♀ ; from the twentieth bipectinate segment the apices of the branches (Pl. xiii. figs. 15, 16) become gradually enlarged

and bear on the oblique apical surface a large number of small cilia, which are curved and have blunt tips (as in *O. epiphaea*-♀).

Genitalia similar to those of *O. epiphaea*-♀: postvaginal sclerite with two oblique ridges, converging towards the orifice, but remaining far apart; they end abruptly, at some distance above the orifice, in a transverse ridge, which laterally curves frontad flanking the orifice. In front of the orifice a large, smooth, strongly chitinised swelling or tubercle, which corresponds to the lid of the orifice in *O. epiphaea*.

Length of forewing: ♂ 29 mm.; ♀ 35 to 40 mm.

Hab. West Ecuador; Panama.

In Mus. Tring from West Ecuador: Paramba, 2 ♂♂; Bulim, 160 ft., i. 1901 (Flemming and Miketta); Lita, 3,000 ft. (Flemming), 1 ♀.—Panama: Chiriqui, 1 ♀.

3. *Oxytenis mirabilis* Cram. (1780) (Pl. vii. fig. 1. ♂).

♂. *Phalaena Attacus mirabilis* Cramer, *Pap. Exot.* iii. p. 143. tab. 272. fig. B (1780) (Surinam).

♂. *Draconipteris mirabilis* Cram., Hübner, *Verz. bek. Schmett.* p. 150. no. 1580 (1820); Walk., *Lep. Het. B.M.* v. p. 1186. no. 1 (1855) (Demerara); Kirby, *Cat. Lep. Het.* p. 764. no. 1 (1892) ("Nicaragua to Guiana" ex err.); Pack., *Monogr. Bomb. Moths*, iii. p. 271 (1914) (partim: Demerara; "Peru" alia spec.).

♂. Body and wings, above, clay-colour to tawny-ochraceous; a brown line (often with a pale border on basal side) from costal margin of forewing close to apex to abdominal margin of hindwing, which it reaches at two-fifths. On forewing a small grey spot at upper cell-angle and a black tuft at lower angle, on disc usually some diffuse dark brown clouds, sometimes the greater part of the wing shaded with dark brown; termen lobate in middle, at R^1 , and denticulate at the other veins; parallel with the oblique line and placed close to it on the distal side a very thin blackish line outlined in white on the outer side, in the last loop of this line three blackish dots.—Hindwing more or less shaded with white on disc, this shading usually concentrated in diffuse blotches, central area often with pink flush, in middle a thin brown line incurved from costal margin to R^1 and then three times deeply angulate, a variable number of small blackish brown submarginal spots; termen entire; anal angle not enlarged as a lobe.

Underside warmer brown than upper, much irrorated with blackish brown, base paler. On forewing a black-brown submarginal line more or less bordered with white on the outer side, termen dark brown.—Hindwing with a nearly straight row of blackish brown spots, which are diffuse, luniform or anguliform, and more or less shaded with white, the costal spot conspicuously white, the row about halfway between cell and termen in centre of wing, terminal area shaded with white posteriorly.

Genitalia (Pl. xiv. fig. 12; Pl. xv. figs. 1, 4, 9–11): Lobes of eighth sternite broader than long, truncate, not acuminate, the angles rounded off and the apex somewhat curved inward (dorsad); sinus round. Tenth tergite divided into two lobes, which are longer than broad, with nearly parallel sides and with the apex rounded. Clasper (Cl) broad, concave on the inner side; process of harpe (H) glossy, tapering, curved dorsad, the base of this process swollen, setose, with a small setose expansion on the dorsal side (left in figure). Apex of penis-sheath in a left-side view with an oblique row of teeth which give this portion of the

sheath sometimes the aspect of a flat helmet (fig. 10, taken from one of our two British Guiana specimens; in our other specimen from that country the apex is as in fig. 9). Seen from the right side the opening of the sheath appears as a curved slit partly covered by a flap L; on the apical side of the slip a tooth D, the last of the left-side row; on the dorsal side the sheath is cariniform, sharp, not rounded or convex.

♀ and early stages not known.

Hab. The Guianas.

In Mus. Tring from: Cayenne, 4 ♂♂ (2 ex coll. Felder); St. Jean de Maroni, 1 ♂ (figured) and St. Laurent de Maroni (E. Le Mout), 1 ♂; British Guiana, 2 ♂♂.

In Mus. Brit. from: British Guiana, 1 ♂.

4. *Oxytenis sobrina* spec. nov.

♂. Outline of wings as in *O. mirabilis*, but as a rule the hindwing with a slight sinus at and below the apex almost as in *O. naemia*-♂. Colour varying from warm tawny (type) to buff, markings as in *O. mirabilis*; in two of our five specimens forewing with large black blotches on disc, and hindwing with submarginal black spots, of which the third and fifth are more proximal and larger than the others.—Underside as in *O. mirabilis*.

The only constant difference is found in the genitalia (Pl. xiv. fig. 13; Pl. xv. figs. 5, 12): Lobes of eighth sternite narrower than in *O. mirabilis*, individually variable, but always narrowing towards apex, sometimes more, sometimes less. Last tergite as in *O. mirabilis*, likewise the clasper and harpe except that the setose base of the curved process P is narrower and the dorsal extension of this swollen portion less distinct. The penis-sheath differs in the apical, helmet-like, hook being much broader than in *O. mirabilis*.

♀ and early stages not known.

This insect evidently represents *O. mirabilis* in the Andesian countries, and the two perhaps will ultimately rank as geographical forms of one species.

Hab. Peru; probably more widely distributed.

In Mus. Tring from: Chanchamayo (A. M. Moss), 1 ♂; Pozuzo, Huanuco, 800–1,000 m. (W. Hoffmanns), 1 ♂; Yahuar Mayo, 1,200 ft., ii. iii. 1912 (H. & C. Watkins), 1 ♂; La Union (type) and Tinguri, Carabaya, 2,000 and 3,000 ft., viii. and xii. 1904 (G. R. Ockenden), 2 ♂♂.

In Mus. Brit. from: Chanchamayo, 2,500–3,000 ft., viii.–x. 1910 (H. & C. Watkins), 1 ♂.

In Mus. Joicey from: Rentema Falls, Upper Marañon, 1,000 ft. (A. & E. Pratt), 1 ♂; Chanchamayo, x. xi. 1906, 2 ♂♂.

5. *Oxytenis naemia* Druce (1906) (Pl. vii. figs. 2 ♂, 11 ♀).

♀. *Oxytenis naemia* Druce, *Ann. Mag. N.H.* (7). xvii. p. 412 (1906) (Peru).

This is the commonest and most widely distributed of the species in which the ♂ has the forewing lobate.

♂. Like *O. mirabilis* variable in colouring, usually buffish clay-colour, often with a more or less distinct pinkish or vinaceous-cinnamon tint, occasionally almost tawny-olive, markings as in *O. mirabilis*; forewing often with black discal blotches, in one of our specimens from S.E. Peru such spots on hindwing, not on

forewing; the three black dots near tornus of forewing very variable, sometimes obsolescent; oblique line frequently cinnamon and not much contrasting with the ground-colour, in other specimens almost black and very prominent, with intergradations.—As a rule the hindwing bisinuate at apex, but some specimens have scarcely a trace of the two sinus; the termen from second sinus to anal angle more rounded in some specimens than in others, sometimes almost straight. The tail-end offers the only reliable differences:

Genitalia (Pl. xiv. fig. 14; Pl. xv. figs. 2, 13–16): Sinus of eighth abdominal sternite large, widest distally, lobes narrowed towards apex, variable in size and outline, sometimes very obtuse, sometimes more triangular, the outer surface slanting upwards, the outer margin of the lobe being more dorsal than the inner margin. Lobes of anal tergite shorter than in *O. mirabilis*. Hook F of harpe broader and somewhat shorter and its swollen setiferous base larger. Penis-sheath rather strongly curved, with a dentate, variable, apical process, which in a ventral aspect is curved towards the left side and more or less frontad in some subspecies; above the opening, i.e. on the apical side of it, a large tooth D, which projects above the orifice; a large, somewhat variable, ventral lobe partly covers the orifice; in a view from the dextro-lateral side the surface of the sheath on the right side of the orifice is convex, not cariniform as in *O. mirabilis*; dentition variable, frequently a tooth at the highest point of curvature of the apical process.

♀. Distribution, frequency of occurrence, and the fact that the Rev. A. Miles Moss has obtained at Pará of this group of species ♂♂ of the above kind, and only specimens of the present ♀ convince us that *O. naemia* really is the ♀ of the ♂ above described. Branches of antenna shorter than in *O. modestia*-♀, acuminate, no patch of short cilia at apices of distal branches (Pl. xviii. fig. 9). Upperside of body and wings dark clay-colour to tawny, more or less irrorated with grey and brownish black scales, sometimes large blackish blotches on disc of both wings; an oblique line as in ♂ from costal margin of forewing close to apex to abdominal margin of hindwing, which it reaches proximally to two-fifths, crossing hind margin of forewing a short distance beyond middle; on the outside of this line on forewing at apex a grey line continued by a row of grey lunules, usually bounded with black-brown, in last lunule two black-brown spots and a third, smaller, spot of the same colour at hindmargin; apex of forewing produced as a well-projecting lobe.—Hindwing in markings similar to that of ♂; termen entire, apical and anal angles distinct, anal angle not widened inward as a distinct lobe.

Underside of body and wings (and apex of abdomen above) ochreous yellow or ochreous buff, the termen of both wings usually brighter yellow. On forewing the apical lobe blackish brown, a straight blackish line from apex to hindmargin, variable in width, crossing R' at two-thirds from lower angle of cell; about halfway to termen some black spots.—On hindwing the oblique line of forewing continued by a lunate line which is nearly parallel with termen, being slightly less curved than terminal margin, none of its lunules shifted in the direction of the cell; a submarginal row of black spots, of which the middle one, R¹-R², is shifted basad and less distinct, sometimes the submarginal spots of both wings and the line of the hindwing obsolete or partly obsolete.

Genitalia: The apical margin of the postvaginal sclerite rounded laterally and a little projecting anad; from this margin obliquely frontad and mesad runs

at each side an obtuse ridge towards the orifice (Pl. xviii. fig. 4), in some specimens the two ridges approach one another closely, in others they remain rather far apart; posterior portion of the sides of this sclerite convex; in front of the orifice a strongly chitinated, high, sharp, transverse ridge covering on the ventral side the large cavity in which the orifice is situated, and curving anad at the sides.

Larva (according to Rev. A. M. Moss, Pará) in fourth instar oily red brown, with many small spines and a short, dark, bifid tail, the dorsal humps larger and lighter on segments 6 and 10, no ocellus on third thoracic segment, which is enlarged sideways; at rest resembling bird-dung, the anterior portion of the body being curved anad. Final (5th) instar (Pl. xiii. fig. 5) dark chocolate, tubercles small and fewer; on third (enlarged) thoracic segment on each side dorsally a spot resembling a half-closed eye when the larva is at rest: consisting of a black pupil and a yellow iris edged with black and bearing a touch of white in the upper corner. Very snake-like, rears up and turns the flexible horn down.

Food-plant: *Palicourea*, *Rubiaceae*.

Hab. Costa Rica to Peru, eastward to Pará. Not known to us from Bolivia, Matto Grosso, Paraguay, and South-East Brazil.

We distinguish the following geographical races by differences in the structure of the penis-sheaths.

(a) *O. naemia orecta* subsp. nov. (Pl. vii. fig. 2. ♂).

♂. Apical process of penis-sheath (Pl. xv. fig. 16) curved obliquely anad and laterad, not frontad, narrow, compressed, more or less twisted, with the posterior edge denticulate. In our only specimen from Costa Rica the process fishtail-shaped, with few teeth; in a specimen from Panama in coll. Dognin shorter, much more dentate; in the specimen from Sta. Marta, likewise unique, the process still shorter, broader, flatter, and strongly denticulate. As in the other subspecies the armature of the sheath is individually variable to a certain extent, we assume this to be the case also in the present subspecies.

♀. We have of this sex a specimen from Sta. Marta; it differs from other ♀♀ of *O. naemia* in the underside being practically devoid of brown irroration. A ♀ from Bogotá in coll. Dognin (Pl. viii. fig. 12) on the contrary is strongly irrorated; it is of a warm ochraceous tawny colour and much resembles Pl. viii. fig. 2 (♂); it is much shaded with purplish black-brown; oblique line very prominent, black dots before tornus of forewing obsolescent as in Pl. vii. fig. 2, almost entirely replaced by grey scaling. Underside ochreous yellow, irrorated with purplish dark brown; oblique line of forewing broad.

Hab. Costa Rica; Panama; Colombia.

In Mus. Tring from: Sixola R., Costa Rica (W. Schaus), 1 ♂, type; Onaca, Sta. Marta, North Colombia, 2,200 ft. (Engelke), 1 ♂, 1 ♀.

In coll. Paul Dognin 1 ♀ from Sta. Fé de Bogotá, and 1 ♂ from Lino, Panama, 800 m. (A. H. Fassel).

(b) *O. naemia aravaca* subsp. nov. (Pl. vii. fig. 11. ♀).

♂. Apical process of penis-sheath compressed, therefore narrow if viewed from the anal direction, its vertical diameter (parallel with the main portion of the sheath) as well as its length and dentition variable, but the apex always curved more or less strongly frontad, forming a hook.

♀. Apparently not different from *O. n. naemia*.

Hab. Venezuela and the Guianas.

In Mus. Tring from : San Esteban, Venezuela (S. M. Klages), 4 ♂♂, 1 ♀; British Guiana, 5 ♂♂, 5 ♀♀, type ♂; St. Laurent de Maroni, French Guiana, vii.1905 (E. Le Mout), 1 ♀.

In Mus. Brit. from : British Guiana (Rodway, Roberts, and Crowley Bequest), 4 ♂♂, 1 ♀.

In Mus. Joicey from : San Esteban, Venezuela, 1 ♂; British Guiana, 1 ♂; French Guiana, 3 ♂♂, 1 ♀.

(c) *O. naemia naemia* Druce (1906).

♀. *Oxytenis naemia* Druce, l.c. (1906) (Peru).

♀. Apical process of penis-sheath curved frontad, forming a hook, its tip broadened and flattened, not compressed (Pl. xv. figs. 13-15); this characteristic less pronounced in Pará specimens.

♀. Apparently not distinguishable from the preceding subspecies.

Hab. Peru, Ecuador, and Amazonia.

In Mus. Tring from Ecuador : Coca, R. Napo, v.-vii.1899 (W. Goodfellow), 1 ♂.—Peru : Chanchamayo (A. M. Moss), 1 ♂; Pozuzo, Huanuco, 800-1,000 m. (W. Hoffmanns), 1 ♂, 2 ♀♀; La Oroya, R. Inambari, Carabaya, 3,700 ft., x. 1904, xii.1905 (G. R. Ockenden), 2 ♂♂.—Amazonia : R. Cachiyaco (Stuart), 1 ♀; Fonteboa, vii.1906 (S. M. Klages), 1 ♂; Teffé, i.1905 (M. de Mathan), 1 ♂; Manáos and Pará (A. M. Moss), 5 ♂♂, 4 ♀♀, 5 pupae-cases, 1 dry larva.

In Mus. Brit. from Peru : Chanchamayo, 1 ♀ (very pale).

In Mus. Joicey from Ecuador : E. Ecuador (ex coll. Druce), 1 ♂.—Peru : La Merced, Chanchamayo, 3,000-4,500 ft., i. ii.1920 (C. Watkins), 2 ♂♂; Chanchamayo, 1,000 m., x. xi.1906, 1 ♂; Chanchamayo, 1 ♂; R. Pacaya, Lower Ucayali, viii. ix.1912, 1 ♂; Pozuzo, 2,000-4,000 ft. (J. Egg), 1 ♂; "Peru," 1 ♀ (type); R. Yahuar mayo, 1,200 ft., v.-vii. (Watkins), 1 ♂.—Amazonia : R. Madeira, 1 ♂.

6. *Oxytenis leda* Druce (1906) (Pl. vii. fig. 4. ♂; viii. fig. 13. ♀).

♀. *Oxytenis leda* Druce, *Ann. Mag. N.H.* (7). xvii. p. 412 (1906) (Peru).

The species was described from a single ♀. Among the various kinds of ♂♂ from Peru (and Amazonia) there is one which appears to us to belong to *leda* on account of the concentration in patches of the whitish grey scaling of the upperside. The specimen we figure of the ♂ sex does not show these grey patches, but agrees in structure with the others in which the upperside is strongly variegated with grey.

♂. Wings slightly narrower than in *O. naemia*-♂; median lobe of termen of forewing a little broader; hindwing more distinctly bisinuate at apex, the angle separating the bays and the one below the second sinus much more projecting, the termen straight (or nearly so) from this lower angle to anal angle. Otherwise similar to *O. naemia*-♂, but the tail-end different.

Genitalia (Pl. xiv. fig. 15; xv. figs. 3, 6, 17, 18): Sinus of eighth sternite deeper than in *O. naemia*, the lobes therefore longer, shape of lobes individually variable, the inner apical angle more projecting than the outer angle, the latter

effaced in one of our specimens. Tenth tergite much broader than in the previous species, the lobes much shorter. The apical hook of the harpe broader in a ventral aspect, its ventral surface being so extended that the oblique distal edge runs nearly straight from the apex of the hook to its base, the incrassate outer portion of the dorsal surface shining through. Penis-sheath quite different from that of any other species: the extreme tip is curved ventrad as a small dentate lobe, the teeth being directed frontad; in a sinistro-lateral aspect only this group of teeth can be seen of the armature, but at the dorsal side, at a considerable distance from the apex, the sheath is suddenly narrowed. Distally of this point the sheath is widened on the right side into a large triangular lobe, which is curved ventrad. The orifice lies further distad; it is large, being flanked on the ventral side by a short broad lobe L; above its distal end a tooth D.

♀. The type has the upperside of the wings dark burnt-umber brown irrorated with blackish brown and variegated with whitish grey; oblique discal line very faint, scarcely visible on hindwing; on forewing a half-moon before middle of hindmargin, convex on outer side, a row of lunules beyond discal line and some submarginal spots, on hindwing a broken subbasal line of three dots (the line indicated also on forewing), an irregular median line of diffuse lunules and some discal blotches whitish grey, conspicuous; the three black spots near tornus of forewing larger than in any ♀ of *O. naemia* we have seen (individual character).—Underside as in *O. naemia*, but hindwing with the submarginal row of spots extending to costa, i.e. a spot present behind C.

In another specimen, in the Berlin Museum, from Massauary, Rio Maues, Amazons, the whitish grey patches of the upperside are barely indicated and the oblique line is very distinct across both wings.

The chief difference from *O. naemia*-♀ is the more strongly convex termen of the forewing (in consequence of which the discal line is a little farther away from the margin) and the structure of the antenna. The longest branches of the innerside almost as long as four segments of the shaft; in distal half of the antenna the tips of the branches flattened on the basi-lateral side (Pl. xviii. fig. 10) and slightly widened, bearing on this small flattened area a number of very short curved close-set cilia quite different from the long seriated cilia of the branches. Genital plate similar to that of *O. naemia*, the oblique ridges strongly marked and evidently (the specimen not dissected) united in a swelling behind the orifice as in the species from S.E. Brazil (cf. no. 9).

In the British Museum there is a Peruvian ♀ which evidently belongs to the same species, although its colouring is different. Upperside buff shaded with clay colour and irrorated with dark brown, no grey patches; on forewing a continuous dark-brown crenate line outside the faint discal line and not so close to it as in *O. naemia*, in last lunule two small black spots, on disc two diffuse blackish blotches; termen as strongly convex as in type-specimen. Underside ochreous as in type; no distinct dark-brown submarginal spot behind C of hindwing. Antennæ missing except the proximal segments.

Hab. Peru and Amazons.

In Mus. Tring from Peru: La Oroya, R. Inambari, Carabaya, 3,100 ft., iii. 1905 (G. R. Ockenden), 1 ♂.—Amazonia: Fonteboa, v. 1906 (S. M. Klages), 1 ♂; "Amazons" (Bates) ex coll. Felder, 1 ♂.

In Mus. Brit. from Peru: Yahuar Mayo, 1,200 ft., iv. 1912, 1 ♂; Chanchamayo, 2,000 m. (l), x. xi. 1906, 1 ♀.

In Mus. Joicey from Peru, 1 ♀.

In Mus. Berlin from Rio Maues, Amazons, 1 ♀, and Chanchamayo, 1 ♂.

7. *Oxytenis erosa* spec. nov.

♂. Only this sex known. In outline and markings of the wings like *O. leda*-♂, differing in the tail-end. One of the 8 specimens examined is without conspicuous grey markings on the upperside.

Genitalia : Lobes of eighth sternite apically narrower than in *O. leda*, usually triangular with the tip rounded, sometimes the apex truncate. Tenth tergite and harpe as in *O. leda*. Penis-sheath (Pl. xv. figs. 19–21) widened from the bent apicad, flattened and concave on ventral side ; at apex a dentate lobe as in *O. leda*, but larger, and at the right side of it a strong conical tooth, the left margin at about two-fifths from apex to bent with a small tooth, and the margin between this tooth and the apex cariniform and minutely serrate ; there is no large flap as in *O. leda* ; in a ventral aspect (as presented in non-dissected specimens) the sheath broader than in a sinistro-lateral aspect, the large subapical tooth appearing to be larger, and the right-side margin more convex, otherwise much the same as fig. 19. The orifice not visible from the ventral side (as it is in *O. leda*), being shifted on to the dorsal surface ; fig. 21 represents the sheath as seen from the right side.

♀ not known.

Hab. The Guianas.

In the Mus. Tring from British Guiana : Potaro R., vii. 1912 (Dr. P. Rendall), 1 ♂, type ; Rio Demerara, 1 ♂.—French Guiana : Nouveau Chantier, ii., and St. Jean du Maroni, 2 ♂♂ (from E. Le Moul't).

In Mus. Joicey from British Guiana, 1 ♂ ex coll. Druce.—French Guiana : Nouveau Chantier, v. vi., and St. Jean du Maroni, x., 3 ♂♂ (from E. Le Moul't) ex coll. Brabant.

8. *Oxytenis nubila* spec. nov.

♂. In the outline of the wings similar to those specimens of *O. naemia* in which the hindwing is bisinuate at apex, but the angles between and below these bays slightly sharper. Wings and body above clay colour, beneath warmer brown, halfway between tawny-ochraceous and hazel, breast with an ochreous tint. Markings as in the other species ; the last one of the three black dots near termen of forewing above larger than or at least as large as the second.

Genitalia (Pl. xiv. fig. 16 ; xv. figs. 7, 8 ; xvi. figs. 1–3) : Sinus of eighth sternite very broad, the lobes narrowing towards apex, but the apex itself dilated on the dorsal side and this dilatation curved mesad, the lobe being somewhat shaped like a spoon. Lobes of tenth tergite nearly as in Pl. xv. fig. 2, being about the same size and shape as the sinus reversed. Hook of harpe long, narrow, pointed, the setiferous swelling at its base appearing, in a ventral view, underneath the hook as an elliptical lobe which is concave on the ventral side. Penis-sheath less curved than in *O. erosa*, with a similar armature, but the subapical tooth of the right side smaller, the marginal tooth of the left side absent, the apical projection longer.

♀ not known.

Hab. Colombia and Nicaragua.

The two specimens known to us evidently represent two subspecies.

(a) *Oxytenis nubila nubila*.

♂. Upperside as much variegated with white-grey as in *O. erosa* and *O. leda*; the three black spots near tornus of forewing rather large, the last much larger than the others. Lobes of eighth sternite (Pl. xiv. fig. 16) short, their inner surfaces deeply concave, sinus very wide, semicircular. Tip of penis-sheath not sharply pointed (Pl. xvi. figs. 1-3).

Length of forewing : 39 mm.

Hab. Colombia; 1 ♂ in Mus. Tring, without more precise locality.

(b) *Oxytenis nubila acuta* subsp. nov.

♂. *Draconipteris mirabilis* Cram., Druce, *Biol. Centr.-Amer., Lep. Het.* i. p. 187. no. 1 (1886) (Nicaragua, "♀" ex err.).

♂. No conspicuous white-grey patches, the three black dots near tornus of forewing small, the last a little larger than the middle one, the first minute. Termen of hindwing less rounded from subapical sinus, anal angle sharper. Lobes of eighth sternite apically narrower and their inner surfaces less concave; the sinus less wide. Hook of harpe more sharply pointed. Extreme tip of penis-sheath curved towards the left side, pointed, forming a short sharp hook.

Length of forewing : 32 mm.

Hab. Chontales, Nicaragua (T. Belt), 1 ♂ in Mus. Brit.

9. *Oxytenis bicornis* spec. nov. (Pl. vii. fig. 3. ♂; viii. fig. 14. ♀).

♂. Wing-shape as in *O. leda*-♂; apex of hindwing distinctly bisinuate, termen from these bays to anal angle slightly rounded. No conspicuous grey patches. Oblique line distinct or rather feebly marked. On underside the crenate discal line of hindwing farthest from termen at R¹, grey costal spot obsolescent or absent.

Genitalia (Pl. xvi. figs. 4-7): Eighth abdominal sternite produced at each side into a long curved spiniform process; sinus very wide. Tenth tergite variable, the lobes as a rule much shorter than they are broad in middle. Harpe as in *O. erosa*. Penis-sheath likewise of the same type as in that species, narrower, the apical dentate lobe and the dorsal subapical tooth much smaller.

♀. So similar to *O. leda*-♀ (cf. p. 162) in the outline of the wings and in the structure of the antenna that I am unable to distinguish the Peruvian and Brazilian specimens with certainty; cf. figs. 13 and 14 of Pl. viii. The question can only be settled when more material from Peru and S.E. Brazil is available for comparison. The two ♀-specimens of the present species we have seen differ from one another much in colour; the one figured is dark burnt umber-brown, with a conspicuous dark brown oblique line on both wings, the grey markings less prominent than in *leda*-♀; the other specimen is ochraceous, the oblique line not conspicuous, of a deeper tawny tint than the ground; both specimens smaller than *leda*-♀, the black spots near tornus of forewing smaller, on underside of hindwing no black submarginal spot below costal vein.

Genitalia (Pl. xviii. fig. 11): the genital sclerite with two strongly marked ridges as in *O. naemia*, these ridges united behind the orifice in a swelling which abruptly terminates on the frontal side (towards the orifice).

Length of forewing : ♂, 29-34 mm.; ♀, 32-34 mm.

Hab. S.E. Brazil.

In Mus. Brit. from : Alto da Serra, Santos, 800 m., iii.1913, 2 ♂♂, 1 ♀, type ♂, and Castro, Parana, 1 ♀ (pale), ex coll. E. D. Jones.

In Mus. Tring. 2 ♂♂ without locality, one of them figured.

10. *Oxytenis peregrina* Cram. (1780) (Pl. vii. fig. 5. ♂).

♀. *Phalaena Attacus peregrina* Cramer, *Pap. Exot.* iv. pp. 30, 251. tab. 305. fig. A (1780) (Surinam).
♀. *Oxytenis peregrina* Cram., Hübner, *Verz. bek. Schmett.* p. 150. no. 1 (1820); Walk., *List Lep. Het. B.M.* v. p. 1183. no. 4 (1855) ("♂" ex err., descr. from Cram.'s fig.); Kirby, *Cat. Lep. Het.* p. 770. no. 4 (1892) (Surinam).

♂. Forewing denticulate, with the antemedian tooth prominent, hindwing strongly bisinuate at apex, a short tail being formed, termen straight from this tail to anal angle, the latter lobate.

Upperside of wings and body deep burnt umber-brown, some submarginal rounded spots on forewing and distal area of hindwing from crenate discal line to termen clay colour; oblique line from near tip of forewing to middle of abdominal margin of hindwing walnut brown.

Underside greyish clay colour, pale ochraceous buff from blackish submarginal line to termen, this line crenate on hindwing and somewhat elbowed.

Genitalia (Pl. xvi. figs. 8-10, 12, 13): Eighth sternite with a median sinus which is about semicircular, the lobes flanking it triangular, their apex rounded and somewhat curved mesad. Lobes of tenth tergite narrower than the sinus, triangular, with the apex broadly rounded. Clasper very distinctive; it is strongly chitinated proximally and ventrally, while the apical dorsal flap is soft; in middle of ventral margin a conical process P^1 , the ventral portion of the clasper forming at three-fourths another process (H), which is large, acuminate, slightly longer than the soft dorsal flap; from the dorsal side of this large hook, near its apex, emanates a fold connecting the hook with the dorsal flap and projecting mesad, being only visible if the clasper is viewed from the inner side. Apex of penis-sheath produced ventrad into a pointed, slightly curved, conical process; orifice terminal, flanked on the dorsal side by a ridge which is bent down and below which there is a small projection from the sheath.

♀. The three specimens before me russet-fawn colour, not so dark as Cramer's figure; large subterminal spots on both wings clay colour, subcircular on forewing, elongate-elliptical on hindwing; a prominent walnut brown line from near apex of forewing, reaching abdominal margin of hindwing beyond middle; discocellular tufts large; anal angle of hindwing projecting abdominad as a broad lobe.

Underside clayish buff, ochreous from submarginal line to termen, this line broad and straight on forewing, somewhat thinner, partly crenulate, parallel with termen on hindwing.

Branches of apical half of antenna (except last two segments) very strongly clavate (Pl. xiii. figs. 17-19), truncate, the terminal surface concave, subcentrally densely covered with minute silky cilia, which lie more or less flat on the surface and are all directed towards the base of the antenna; about 25 segments have these clavate branches, on the segments preceding them the incrassation gradually becomes less pronounced, being entirely absent from the branches of the proximal eighteen (about) bipectinate segments.

Genitalia : A broad median stripe of the postvaginal sclerite strongly chitinated, glossy, slightly widened at apex and here convex (Pl. xvi. fig. 12); this strip of chitin projecting from between the segments, being visible without dissection; in the cavity the strip continuous with the ridge which bounds the orifice on the right and left sides; in front of the orifice a nearly semicircular fold which serves as a movable lid for the orifice, which it completely closes. Pl. xvi. fig. 13 is taken from another, old, specimen with doubtful locality.

Early stages not known.

Length of forewing : ♂, 35 to 40 mm. ; ♀, 44 to 47 mm.

Hab. The Guianas, Amazonia, and Peru; may be expected to occur also in Venezuela, Colombia, Ecuador, and Bolivia.

In Mus. Tring from : Cayenne, 1 ♀, ex coll. Felder. — Amazonia : Santarem (A. M. Moss), 1 ♂; Fonteboa, v. 1906 (S. M. Klages), 1 ♂. — La Union, Carabaya, S.E. Peru, xi. 1904 (G. R. Ockenden), 4 ♂♂.

In Mus. Joicey from : Nouveau Chantier, French Guiana (ex coll. Brabant), 1 ♂, 1 ♀. Essequibo R., British Guiana (Whiteley), 1 ♀.

11. *Oxytenis epiphaea* spec. nov.

♂. Shape of wings as in *O. peregrina*-♂ (Pl. vii. fig. 5), but the apical lobe of the forewing narrower and the minute teeth of the termen between the prominent antemedian tooth and the tornus absent. Upperside of wings almost uniformly mummy brown from base to termen; on forewing two clayish submarginal spots R^3-M^2 ; on hindwing obsolescent, elongate-elliptical, submarginal, clayish spots R^3-M^2 bounded distally by blackish brown lunules; oblique line from near apex of forewing reaching abdominal margin of hindwing before middle.

Underside cinnamon, densely irrorated with blackish brown as in *O. peregrina*, black submarginal line on both wings as in *O. peregrina*, subterminal cinnamon spots indicated, but not so distinct as in *O. peregrina*, hardly brighter than the disc, base shading into wood-brown, which is the colour of the underside of the body.

Antenna with 49 bipectinate segments, the branches much longer than in *O. peregrina*-♂, the branch of the inner (= anterior) side of the tenth segment from apex as long as five segments of the shaft, in *O. peregrina*-♂ as long as three segments.

Genitalia (Pl. xvi. figs. 14–18) : Eighth sternite truncate, the angles produced each into a long, thin, spiniform, curved process. Sides of anal tergite incurved, the apical lobes about as large as the median sinus. On the clasper the short conical process found in *O. peregrina*-♂ replaced by a swelling, the apical process of the harpe not so long as the dorsal flap, ending with a sharply pointed, gently curved, and rather long hook. Penis-sheath rather strongly curved twice; the apex as in *O. peregrina* strongly enlarged ventrad, but this portion not forming a long conical tooth, but remaining broad to the end, flattened underneath, and bearing a small tooth on the left side at the apical edge; dorsally at the subapical bent the sheath is compressed into an obtuse ridge, and between this ridge and the orifice there is a compressed, triangular, tooth.

♀. We place here two Peruvian ♀♀ in coll. Joicey; they are much worn on the upperside and therefore appear strongly mottled with buff and burnt

umber-brown. Body above fawn colour, wings shaded with the same tint, oblique discal line deep russet, pale submarginal ovate blotches on both wings as in *O. peregrina*, discocellular tufts conspicuous above and below, anal angle of hindwing lobate.

Underside of body and wings ochre yellow, foretibia and all the tarsi dark brown, not spotted; black line from apex of forewing very conspicuous, parallel with termen on hindwing and about 7 mm. distant from it, somewhat crenate in posterior half.

Antenna of ♀ nearly as in *O. peregrina*-♀, the branches of the nineteen proximal segments pointed, the others clavate with the exception of the last three, the apices not so strongly widened and their ciliate areas more slanting than in *O. peregrina*.

Genitalia (Pl. xviii. fig. 8): Postvaginal sclerite with two anteriorly converging, short ridges nearly as in *O. naemia*-♀; in front of the orifice there is a semicircular, glossy, strongly chitinised flap which forms a kind of lid for the cavity; this lid lies asymmetrically towards the right side and its margin is on this side continuous with a ridge of the postvaginal sclerite, whereas on the left side the cavity is open and the margin of the lid runs deep down into it, not being continuous with the ridge which bounds the cavity on this side.

Length of forewing: ♂, 38 mm.; ♀, 41 to 45 mm.

Hab. Peru.

In Mus. Tring from: La Oroya, R. Inambari, Carabaya, ix. 1904, 3,100 ft., dry season (G. R. Ockenden), 1 ♂, type.

In Mus. Joicey from: Huancabamba, 6,000–10,000 ft. (E. Böttger), 1 ♀; Marcapata (from Staudinger), 1 ♀.

12. *Oxytenis plettina* spec. nov.

♂. Two specimens different in size and colouring, but agreeing in structure. The larger one (type) almost exactly like Pl. vii. fig. 5; a little smaller, the termen of the forewing and the apical area and angle of the hindwing dark burnt umber-brown like the median area of both wings; two submarginal spots on forewing and a less distinct lunule below them tawny olive, on hindwing a large area from tail to M² and from fringe to the sharply dentate postmedian crenate line likewise tawny olive, less pale than in *O. peregrina*-♂.

Underside russet-fawn colour; brownish black submarginal line crenulate on both wings except towards apex of forewing; outside the line two rounded spots on forewing and five patches on hindwing from SC² to M² dull ferruginous, this colour extending to termen from SC² to R², some black subterminal bars as in other species.

The smaller specimen is above almost entirely deep fawn colour with a pale walnut-brown tint, on forewing two round, pale, submarginal spots, less prominent than in the larger specimen, on hindwing the crenate line visible, the ground outside this line very slightly paler than the median area, the large elliptical patches of *O. peregrina* being but very faintly indicated, and the whole termen being the brown colour of the median area.—Underside pale wood-brown shaded with fawn colour, the blackish submarginal line faint, and the ferruginous subterminal patches obsolescent. In both specimens the branches of the antenna not quite so long as in *O. epiphaea*, but longer than in *O. peregrina*, the inner

branch of the tenth segment from apex being about as long as four segments of the shaft.

Genitalia (Pl. xvii. figs. 1-6): Eighth sternite medianly incised, the lateral pointed process proximally broader than in *O. epiphaea*, recurved distad. Lobes of anal tergite smaller than the median sinus, the lateral margin of the segment angulate in middle, not so strongly incurved as in *O. epiphaea*. The antemedian setiferous swelling of the clasper more prominent than in *O. epiphaea*, the apical process of the harpe as sharply pointed as in that species, but rather more directed anad. Penis-sheath curved as in *O. epiphaea*; the apex less widened, the orifice not terminal, but dorsal, and the left portion of the ventral margin of the orifice enlarged into a long pointed process which is directed sinistrad and dorsad; on the dorsal side there is a broad lobe at the orifice, dentate at the edge and curved basad away from the orifice.

♀ not known.

Length of forewing: ♂, 28 to 34 mm.

Hab. Ecuador.

In Mus. Tring from West Ecuador: Salidero, 350 ft., ii. iii. 1901, type, and Bulim, 160 ft., xii. 1900 (Flemming & Miketta), 2 ♂♂.

13. *Oxytenis beprea* Druce (1886) (Pl. vii. fig. 10. ♂; viii. fig. 1. ♂).

♀. *Oxytenis beprea* Druce, *Biol. Centr.-Amer., Lep. Het.* i. p. 199. no. 4. tab. 21. fig. 3, 4 (1886) (Chiriqui, coll. Staudinger); Kirby, *Cat. Lep. Het.* p. 770. no. 10 (1892).

♂. *Draconipteris mirabilis* Cram., Druce (err. determinationis), *Biol. Centr.-Amer., Lep. Het.* i. p. 187. no. 1 (1886) (partim; Chiriqui); id., *l.c.* ii. p. 422 (1897) (Belize).

♂. Small. Apex of forewing sharply pointed, more so than in any of the previous species with tailed hindwing, termen of forewing either entire or with a small antemedian tooth, anterior sinus of hindwing often almost effaced, tail a little less pointed than in *O. epiphaea* and *pletina*.

Colour very variable. Upperside (Pl. vii. fig. 10) greyish wood-brown (Ridgway, *Nom. Colours*, iii. 19), on forewing a thin dark brown line deeply incurved below cell, excurved in cell and before hindmargin, continued across hindwing; at two-thirds a diffuse darkish band at right angles to costal margin and ending at the oblique line, which is very prominent; outside this line a shadowy line of the colour of the diffuse band, and beyond this a crenate line, in the two bays R¹-M¹ of which there is a fairly conspicuous clayish spot each.—On hindwing beyond middle a thin but distinct dentate line; the space between this line and the deep brown antemedian line darker than the ground, a median band being formed which is narrower in costal third, being narrowest below subcostal; in terminal area some dark brown spots, between them and the dentate line indications of the elliptical patches of *O. peregrina*, fringe dark brown, termen washed with dark brown from tail to anal angle.

A specimen from Chiriqui (coll. Joicey) similar to the above, but the elliptical patches of the hindwing slightly better indicated. A third specimen (Belize, coll. Joicey) pale burnt umber-brown with a shade of fawn colour, with hardly any markings, apart from the walnut-brown oblique line, and the small black discocellular tufts. A fourth (Brit. Honduras, Mus. Tring) clayish ochraceous, with the dark-brown subterminal spots distinct and the rounded patches in the terminal area indicated. A fifth specimen, from Chiriqui (Mus. Brit.), larger,

forewing 35 mm. long, the forewing and the median band of the hindwing blackish walnut brown, base and three subterminal spots on forewing and the rest of the hindwing rufescent hazel (Pl. viii. fig. 1).

Underside varying from wood-brown shaded in terminal area with russet, to russet hazel shaded proximally with wood-brown; a black line on both wings as in *O. angulata*.

Branches of antenna (as in *O. plettina*) longer than in *O. peregrina*, shorter than in *O. epiphaea*, the inner branch of the tenth segment from apex being nearly as long as four segments of the shaft.

Genitalia (Pl. xvii. figs. 7-9): Apical margin of eighth sternite evenly incurved, not triangularly incised in centre, lateral horns as in *O. plettina*. Tenth tergite rather broader than in *O. plettina*. Clasper as in that species. Penis-sheath different: orifice on the ventral side towards the right, partly closed from this side by a soft flap F which can be turned away from the orifice, while the dorsal wall of the orifice is strongly chitinised, hard; from the dorsal margin on the right side, at some distance from the extreme tip, there is a triangular tooth, conical in ventral and dorsal aspects, though it is in reality compressed, being a widening out of the margin of the orifice; this tooth is homologous to the left side subapical process of *O. plettina*, but a twist in the sheath has moved the orifice from the dorsal to the ventral side and turned the left ventral process into a right dorsal one; the size of the tooth variable; the sheath has its bent beyond middle.

♀. Druce's figure is misleading; it is too yellow, and the abdominal margin is figured as being straight, whereas in the type-specimen (which has been very kindly sent to me from Berlin) the anal angle is widened inward as a broad rounded lobe. Upperside of wings wood-brown; discocellular tufts distinct; markings as in *O. peregrina*-♀, but less heavy, the submarginal bars of forewing less curved; the specimen also recalls our Pl. vii. fig. 14, but the discal line is much thinner, termen of forewing much more convex, outside the median line of hindwing a crenate line, and at abdominal margin outside the crenate line three brown spots as in *O. peregrina*-♀.—Underside pale dirty yellow, much irrorated with brown, shading into wood-brown basally, discocellular tufts small, but distinct, dark brown line broad, simple on forewing, crenate on hindwing.—Branches of distal segments of antenna dilated at apex, a little more than in our Pl. xiii. fig. 16, but much less than in *O. peregrina*-♀ (Pl. xiii. figs. 17-19), the ciliate apical surface oblique.—Genitalia similar to Pl. xviii. fig. 6, but the median longitudinal elevated bar less strongly chitinised (in the unique specimen), and the orifice with free margins, without the sort of lid found in *O. peregrina*.

Length of forewing: ♂, 26 to 35 mm.; ♀ 36 mm.

Hab. British Honduras; Panama.

In Mus. Tring from: Orange Walk, viii. 1917 (M. G. Palmer), 1 ♂; Brit. Honduras, 1 ♂.

In Mus. Brit. from: Chiriqui, 1 ♂ (Pl. viii. fig. 1).

In Mus. Joicey from: Belize (A. Moloney), 1 ♂, and Chiriqui (Arcé), 1 ♂, both ex coll. Druce.

In Mus. Berlin 1 ♀ (type) from Chiriqui (ex coll. Staudinger).

14. *Oxytenis angulata* Cram. (1775) (Pl. vii. fig. 6. ♂, 7. ♀).

- ♂. *Phalaena Attacus argulata* Cramer, *Pap. Exot.* i. p. 96. tab. 61. figs. E, F (1775) (Surinam).
 ♂. *Phalaena Attacus angulata* Cramer, l.c., Index, p. 151 (1775).
 ♂. *Bombyx argulata* Cram., Fabricius, *Spec. Ins.* ii. p. 172. no. 26 (1781); id., *Mant. Ins.* ii. p. 110. no. 29 (1787); id., *Ent. Syst.* iii. 1. p. 418. no. 34 (1793).
 ♂. *Teratopteris harpago* Hübner, *Verz. bek. Schmett.* p. 151. no. 1683 (1820).
 ♂. *Teratopteris angulata* Cram., Walker, *Lep. Het. B.M.* v. p. 1185. no. 2 (1855); Kirby, *Cat. Lep. Het.* p. 764. no. 1 (1892) (Surinam).
 ♂. *Draconipteris angulata* Cram., Packard, *Monogr. Bomb. Moths*, iii. p. 271 (1914) (Amazons).
 ♀. *Phalaena Attacus zerbina* Cramer, l.c. iii. p. 171. tab. 287, fig. E (1780) (Surinam).
 ♀. *Syssaura zerbina* Cram., Hübner, l.c., p. 150, no. 1574 (1820).
 ♀. *Oxytenis zerbina* Cram., Walker, l.c., p. 1182, no. 1 (1855) (partim; "♂" ex err.); Kirby, l.c. p. 770. no. 1 (1892).

Both sexes very variable in size and colour.

♂. Upperside of body and wings varying from dark sepia brown to clay-colour; fringe of distal margin more or less deep brown, bounded by a thin greyish white marginal line, which is often indistinct. Forewing dentate, tooth R¹ prominent, a grey submarginal spot in front of R¹, usually an oblique submarginal line from costal margin near apex to about three-fourths of hindmargin, dark brown, on disc a dark cloud, at basal third a transverse dark brown line broken at M and curved from this vein to hindmargin.—On hindwing the proximal line of forewing continued straight to basal fourth of abdominal margin; a discal line from three-fourths of costa to three-fifths of abdominal margin, curved, zigzag, particularly in posterior half, outside this line posteriorly indications of pale elliptical blotches; as on forewing all these markings often hardly traceable.

Underside much paler than upper, shaded with grey, terminal area washed with tawny or ochraceous; dark brown submarginal line of forewing conspicuous, continued across disc of hindwing, where it is usually less prominent; dark brown submarginal blotches on both wings, often indistinct on forewing, between them and discal line on hindwing tawny elliptical markings, vestigial or distinct.

Genitalia (Pl. xvii. figs. 10, 12–15): Eighth sternite truncate-bisinate, sides rounded, median lobe usually reduced to a small tooth. Tenth tergite broad, almost gradually narrower apically, the sides very slightly incurved, apex divided into two rounded lobes usually about the size of the sinus which separates them. Upper flap Cl of clasper of nearly even width, ventrally excised at the apex, the lobe situated proximally of the sinus quite short, the apical lobe longer, rounded, Cl membranous except its dorsal margin, which is strongly chitinated like the rest of the clasper; ventral process P¹ irregularly flattened, slightly twisted, apex rounded and a little curved laterad. Penis-sheath with the orifice terminal, surrounded by a prominent armature consisting of a dentate lobe on the right side, a short stout ventral hook, and a longer left process directed obliquely frontad, all somewhat variable.

♀. Pale orange buff; a thin ochraceous or gallstone yellow line from costal margin of forewing near apex to middle of abdominal margin of hindwing, on forewing often blackish brown towards apex and on hindwing frequently obsolete; outside this line a row of lunules, indistinct on forewing, usually distinct on hindwing, russet, sometimes widened and diffuse, a submarginal row of russet bars, more or less luniform with the concave side towards base, particularly the

posterior ones of hindwing, terminal area of hindwing shaded with russet or dark brown, the elliptical internervular spaces bounded by the submarginal bars as pale yellow as the proximal area of the wing and therefore contrasting with the darker terminal area. Fringe of both wings sepia colour or tawny olive. Antemedian line indicated or distinct from SM¹ of forewing to abdominal margin of hindwing, sometimes absent. In some specimens the greater part of the upperside clayish russet. Tip of distal branches of antenna without a cluster of minute cilia.

The lines in outer area of underside olive or drab, broader and bolder than above, one line on forewing, two on hindwing, the pale yellow elliptical spots between the lines of hindwing prominent.

Genital cavity of ♀ very deep, longer than broad, sharply defined, the sides perpendicular, the lateral ridge posteriorly forked (Pl. xviii. fig. 2).

Length of forewing : ♂, 23 to 32 mm. ; ♀, 24 to 34 mm.

Larva resembling bird's dropping, black, each segment with a row of small papillae, some of them tawny, the others whitish grey, lobes of metathorax dirty tawny. On *Randia formosa*. Bred by A. M. Moss at Pará.

Hab. Orinoco, the Guianas, Lower Amazons.

In the Tring Museum a series of both sexes from : Venezuela : Maripa, Caura R., Orinoco, all months from ix. to i. (S. M. Klages).—British Guiana. —Pará (A. M. Moss) ; Amazons (Bates), ex coll. Felder.

In Mus. Brit. from : British Guiana, 2 ♂♂ ; French Guiana, 1 ♀.—Pará, 2 ♀♀.

In Mus. Joicey from : French Guiana.

15. *Oxytenis ferruginea* Walk. (1855).

♀. *Oxytenis zerhina* Cram., Walker (err. determinationis), *Lep. Het. B.M.*, p. 1182, no. 1 (1855) (partim ; Venezuela).

♂. *Teratopteris ferruginea* Walker, *l.c.* v. p. 1184. no. 1 (1855) (Venezuela) ; Kirby, *Cat. Lep. Het.* p. 764. no. 2 (1892).

♂♀. In colour and shape like *O. angulata*, and just as variable, differing in the tail-end of the abdomen.

♂. Tenth tergite (Pl. xvii. figs. 11, 16–18) rather deeply incurved at the sides, subapically rounded-dilated, the apex sinuate, the apical lobes pointed or at least much less rounded at the sinus than outwardly. Membranous portion of clasper less distinctly sinuate below apex than in *O. angulata*, and process P² much slenderer. Penis-sheath very slender, gradually and slightly curved, gradually tapering, bearing an armature of two minute teeth.

♀. Genital cavity large (Pl. xviii. fig. 3), almost evenly concave, flanked by a broad fold, orifice proximal, small, very much smaller than in *O. angulata*, behind it often a distinct tubercle.

Larva found by J. Steinbach in S.E. Bolivia ; similar to that of *O. angulata*, "almost entirely black, very slightly variegated with tawny, resembling bird's dropping, appearing as if damp and being very repulsive." Pupated on the ground, spinning a few shreds, imago (♂♀) emerged 11 days after pupation.

Length of forewing : ♂, 21 to 34 mm. ; ♀, 29 to 36 mm. (limits of variation probably wider).

Hab. Panama to Venezuela, southward to Bolivia and Matto Grosso.

In the Tring Museum from : Panama, 1 ♀.—Venezuela : Palma Sola, 6 ♂♂; Valencia, 1 ♂; San Esteban, vii.1909 (S. M. Klages), 1 ♂.—Upper Amazons : Fonteboa, x.1906, and Codajas, iv.1907 (S. M. Klages), 2 ♂♂.—Peru : La Union, Rio Huacamayo, Carabaya, 2,000 ft., xii.1904 (G. R. Ockenden), 1 ♂.—Bolivia : Prov. Sará, Sta. Cruz de la Sierra, ii.-vi.1904, and Buenavista, 750 m., viii.1906-iv.1907 (J. Steinbach), 2 ♂♂, 2 ♀♀.—Matto Grosso : Cuyabá, 1 ♂, 3 ♀♀ (rec. from P. Zobrys).

In Mus. Brit. from : Venezuela, 1 ♂ (type), 1 ♀.—Colombia, 1 ♂.—Peru : Yahuarmayo, 1 ♂; Chanchamayo, 1 ♀.

In Mus. Joicey from : Sta. Cruz de la Sierra (J. Steinbach), and Cuyabá to Corumba, Matto Grosso, a series of both sexes.

16. *Oxytenis gigantea* Druce (1890) (Pl. viii. figs. 3, 4. ♂♂).

♂. *Draconipteris gigantea* Druce, *Proc. Zool. Soc. Lond.* p. 502. tab. 43. fig. 4 (1890) (Sarayacu, Ecuador); Kirby, *Cat. Lep. Het.* p. 764. no. 2 (1892) (Ecuador).

♂. Termen of forewing denticulate, all the teeth small, the median one slightly larger than the others. Hindwing strongly bisinuate at apex, the second bay deeper than the first, and angle enlarged as a rounded lobe. This lobe is accidentally turned under in type-specimen (cf. Pl. viii. fig. 3), and therefore not visible in a dorsal view. Colour very variable, upperside ochraceous ochre yellow to mummy brown (Ridgway, *Nomencl. Colours*, iii. 10), in the darkest specimen (Pl. viii. fig. 4) the body almost black; forewing shaded with greyish white, a broad bar on discocellulars, a discal band parallel with this bar and nearly the whole terminal area devoid of white shading. Oblique line across both wings double, the inner line paler than the outer one, in between them a white or whitish line.

Underside brighter than upper, in the dark specimen more or less tawny on wings and body, shading into buff at base of hindwing. The brownish black line which runs from costal margin of forewing close to apex to abdominal margin of hindwing, is even on both wings, not crenulate or dentate. Forelegs not spotted.

Genitalia (Pl. xvii. figs. 20-22, 24): Eighth sternite with a median sinus which is about semicircular, flanked by a short, more or less obtuse process, laterally the sternite produced into a long, tapering, sharply pointed horn. Tenth tergite bilobate, the lobes broader than the median sinus, broader than long, obliquely truncate and usually slightly sinuate, the tergite constricted proximally to lobes. Harpe ending with a long, tapering, pointed process, which curves mesad in a ventral view. Penis-sheath very stout, strongly curved, armed at apex on the ventral side with a longitudinal dentate ridge and on the dorsal side with a strong tooth, which varies in size, being smaller in type-specimen than in our fig. 24 (taken from another specimen, from R. Pastaza, Ecuador).

♀ not known.

Length of forewing : 34 to 39 mm.

Hab. Ecuador and Peru.

In Mus. Joicey from Ecuador : Sarayacu (C. Buckler), 1 ♂; Alpayacu, R. Pastaza, 3,600 ft. (M. G. Palmer), 1 ♂; "Ecuador" (from Staudinger), 1 ♂, very dark.—Peru : Pozuzo, 2,000-4,000 ft. (J. Egg), 1 ♂.

17. *Oxytenis spadix* spec. nov. (Pl. viii. fig. 2. ♂).

♂. Allied to *O. gigantea*. Branches of antenna longer, f.i. the fourth inner branch from apex longer than two segments of the shaft. Upperside of abdomen purplish black-brown from middle to near apex.

Upperside of wings ochraceous, with a slight purplish red tint and shaded with greyish white, an oblique space across apex of cell and another farther distal without grey scaling; the double line which runs from apex of forewing to middle of abdominal margin of hindwing much heavier than in *O. gigantea*, the proximal one brownish black, more prominent than the outer one, which is shaded with grey, in between them a greyish white line; termen black at and below apex; outside the double line a very thin and feebly marked crenate line continued to apex of wing by a thin greyish white line; three small submarginal blotches brown, the last of them lunate, convex on outer side; a greyish white marginal line very thin; fringe dark brown, no black dots near tornus; as in *O. gigantea* marginal tooth R^1 small, the margin being but slightly excised in front of and behind middle.—Hindwing bisinuate at apex, anal angle lobate as in *O. gigantea*; outside the double line the usual markings: a faint, deeply crenate, line, then follows an ochraceous space as pale as the middle of the termen, and further a submarginal row of dark brown spots, a thin greyish white marginal line obsolete in middle.

Underside paler than upper, ochreous yellow towards base, irrorated with purplish black-brown; on forewing a submarginal line from apex, brown-black, single, crossing M^1 8 mm. from termen, margin at and below apex brown-black, the line slightly angulate at R^1 .—Hindwing without the well-defined line of *O. gigantea*, bearing instead a diffuse narrow blackish band, which extends from near apex to middle and is continued by some triangular or angle-shaped spots, the distance (9 mm.) of these spots from the termen being about three times that of the band at costa, whereas in *O. gigantea* the line is posteriorly about as near the termen as anteriorly; halfway to termen a row of blackish spots, more or less triangular and diffuse, no spot between M^1 and abdominal margin, anterior half of termen tawny ochraceous, its posterior half as far basad as the post-discal spots shaded with drab-grey.

Genitalia (Pl. xvii. figs. 19, 23): The two lobes of the tenth tergite triangular, with the apex rounded. Eighth sternite asymmetrical in the only specimen known to us, the pointed process of the right side being much shorter than that of the left side and bearing a tooth; the median sinus, which in *O. gigantea* is almost semicircular, is narrow and very deep, being about twice as deep as it is wide distally. Penis-sheath (not taken out; its exact structure therefore not known) as far as can be ascertained similar to that of *O. gigantea*, but the row of small teeth missing.

Length of forewing: ♂, 36 mm.

Hab. Colombia.

In coll. Paul Dognin 1 ♂ from Alto de las Cruces, Western Cordillera, 2,000 m., ii.1909 (A. H. Fassl).

Key to the species of *Oxytenis* :

I. Males.

1. Termen of fore- and hindwing even 2
 Termen of forewing with large antemedian lobe, hindwing rounded or at apex bisinuate 3
 Termen of forewing with or without teeth, in the former case the antemedian tooth symmetrical, not curved backwards; hindwing with tail before middle of termen 5
2. Hindwing below with basal half yellow, contrasting with the outer half and bounded by a lobate line (the lunules composing it convex on outer side) *O. modestia*
 Hindwing below almost uniform in colour, with a continuous, broad, black discal line *O. albilunulata*
3. Lobes of eighth sternite truncate *O. mirabilis*
 Lobes of eighth sternite rounded-triangular 4
 Lobes of eighth sternite drawn out into a long thin process *O. bicornis*
4. Apical armature of penis-sheath in the shape of a helmet, of which the lower margin is dentate (ventral aspect) *O. sobrina*
 Apical process of penis-sheath narrow, projecting far beyond the orifice, with a large tooth above the orifice and a large lobe on the left side of the orifice; hindwing bisinuate at apex *O. naemia*
 Penis-sheath widened before apex on the right side into a large triangular lobe; hindwing subtruncate, at apex bisinuate *O. leda*
 Penis-sheath with a small dentate apical lobe which is bent frontad, at the right side of the lobe a fairly large tooth, on the back of the sheath from apex basad a minutely serrate ridge which terminates with a tooth; hindwing as in *O. leda* *O. erosa*
 Penis-sheath nearly as in *O. erosa*, but without a dorsal tooth; lobes of eighth sternite short and so twisted that they turn their concave uppersides towards each other; hindwing rounded, at apex bisinuate *O. nubila*
5. Termen of forewing with a large tooth in middle 6
 Termen of forewing with a very small tooth or without teeth 10
6. Foretibia conspicuously spotted 7
 Foretibia not distinctly spotted 8
7. Anal tergite gradually narrowed, sides not distinctly incurved *O. angulata*
 Anal tergite very distinctly incurved and then strongly excurved *O. ferruginea*
8. Eighth sternite with short obtuse lobes; terminal area of hindwing clay-colour, rest dark brown. *O. peregrina*
 Eighth sternite with very long, thin, pointed processes 9
9. Penis-sheath without long spiniform apical tooth *O. epiphaea*
 Penis-sheath with long spiniform apical tooth *O. plettina*
10. Sides of anal tergite strongly incurved, apical lobes truncate *O. gigantea*
 Anal tergite almost gradually narrowed, apical lobes triangular with the apex rounded off 11
11. Eighth sternite medianly deeply incised *O. spadix*
 Eighth sternite medianly not incised *O. beprea*

II. Females (known of only 9 species).

1. Branches of distal half of antenna without cluster of minute cilia at apex 2
 Branches of distal half of antenna with cluster of minute cilia at apex 4
2. Forewing above with 2 or 3 black spots before tornus at outer side of oblique line ; upperside of both wings almost uniformly tawny brown (variable in depth of tint), without yellow patches *O. naemia*
 Forewing above without black spots before tornus ; in dark terminal area of hindwing above and below large yellow elliptical patches, often the greater portion of the upperside yellow like the underside 3
3. Genital cavity sharply defined, with perpendicular sides *O. angulata*
 Genital cavity large, gradually deepening, rather indefinite *O. ferruginea*
4. Apex of distal branches of antenna hardly at all enlarged, anal angle of hindwing not lobate 5
 Apex of distal branches of antenna considerably enlarged, anal angle of hindwing projecting abdominad 6
5. No black dots on forewing above before tornus ; on underside of hindwing a discal row of separate blackish brown lunules of which the fourth is more distal than the two before and the two behind it *O. modestia*
 With two or three black dots on forewing before tornus at outer side of oblique line *O. leda* and *O. bicornis*
6. Apex of distal segments of antenna quite abruptly clavate, truncate ; genital sclerite with a conspicuous longitudinal median strip of chitin *O. peregrina*
 Apex of distal segment more gradually and not so strongly enlarged, the ciliate end-surface oblique in lateral aspect ; genital sclerite with median strip of chitin *O. beprea*
 Apex of distal segments gradually enlarged ; genital sclerite without longitudinal raised strip of chitin 7
7. Tawny line of upperside of hindwing, reaching abdominal margin in middle ; discocellular tufts conspicuous above and below *O. epiphæa*
 Tawny line reaching abdominal margin at three-fifths ; discocellular tuft minute on forewing, absent from hindwing *O. albilunulata*

3. Genus : **Homoeopteryx** gen. nov. (ex Felder 1874 indescr.).

Homoeopteryx Felder, *Reise Novara*, tab. 94. *Erklärung*, p. 5 (1874) (no diagn.); Kirby, *Cat. Lep. Het.* 804 (1892).

We employ the Felders' indescript name for our conception of a genus which differs from *Oxytenis* in the following essentials :

♂♀. Wings entire, similar in the sexes in contours and markings, but termen of forewing more rounded in ♀. No discocellular tuft of raised scales. Antennae and branches longer than in *Oxytenis*, with longer and thicker bristles, the last two (♀) or three (♂) segments ventrally with a number of sensory cones which in ♂ are placed at the margin of a somewhat hand-shaped projection ; in ♀ (Pl. xiii. figs. 20-23) the previous 12 to 16 segments with the shaft strongly dilated ventrad and gradually laterad, a segment recalling an anvil, the flat, ventral surface being nearly square, or transverse, or longer than broad and clothed with a dense pile of short cilia, the segment previous to these modified ones with a ventral process ; the apical projections of the distal segments of *Oxytenis* not present in *Homoeopteryx*. Upper cell-angle of forewing (Pl. xiii. fig. 3) acute,

vein supporting apical lobe of wing deeply deflexed in both sexes, SC¹ from cell at some distance from apex, R¹ from upper cell-angle, sometimes from subcostals close to cell; in hindwing SC close to C for some distance, gradually diverging, SC¹ and R¹ on a rather long stalk. Penis-sheath (Pl. xix. fig. 7) without the guiding rod of *Oxytenis*.

Early stages not known.

Hab. Panama to Bolivia and British Guiana; few specimens in collections.

Genotype: *malecena* Druce (1886).

Five species are known.

We cannot make *syssauroides* Feld. the genotype of this genus, as the only known specimen has neither antenna nor abdomen and could not serve for drawing up the above description.

1. *Homoeopteryx malecena* Druce (1886).

♂. *Oxytenis malecena* Druce, *Biol. Centr.-Amer., Lep. Het.* i. p. 198. no. 3. tab. 21. fig. 2 (1886) (Chiriqui).

Oxytenis malacena (!) Druce, Kirby, *Cat. Lep. Het.* p. 770. no. 9 (1892).

♂. Upperside cream-buff; a straight line from apex of forewing crosses hindmargin of forewing beyond one-third and reaches abdominal margin of hindwing before one-third; about halfway to termen large elliptical patches, usually not conspicuous, paler than the interspace between them and the oblique line, bounded on the proximal side by a crenate line and on the terminal side by a less distinct scalloped line; on hindwing a submarginal row of blackish dots.

On underside a blackish crenate submarginal line edged with grey, oblique on forewing, 8 to 10 mm. distant from termen at M² and running up to apex, on hindwing slightly curved, about twice as far away from termen posteriorly than at costa; on the basal side of this line on both wings a diffuse ochraceous band nearly parallel with the line, touching lower cell-angle on hindwing.

Genitalia (Pl. xviii. figs. 13-17): Eighth sternite truncate-emarginate, the angles produced into a very long spine. Lobes of tenth tergite widely apart, with the apex obtuse, flattened above and slightly twisted. Process of harpe gently curved inwards, widened at apex and truncate; clasper ending with a slender, spathulate lobe which reaches beyond the apex of the anal tergite. Penis-sheath longest on the dorsal side, the opening on the ventral side, dorsal margin (= extreme tip of sheath) rounded, no teeth or processes. Penis-funnel with a sharply pointed process at each side.

♀. Similar to ♂. Forewing a little broader and its distal margin slightly more rounded. Markings essentially as in ♂. Colour of upperside in the two specimens before me yellowish buff and clayish wood-brown, 15 or 16 distal segments of the antenna have the shaft enlarged ventrally, the surfaces of these enlarged portions broader than long, a few of them as long as broad (Pl. xiii. figs. 20-23).

Genital sclerite with sharp apical edge, which is rounded laterally; surface of sclerite rather flat, concave at the side of the orifice and slightly convex behind it. In front of the orifice a transverse ridge, concealing the orifice, the margin of this ridge rather thick, smooth.

Length of forewing: ♂, 35 mm.; ♀, 34 mm.

Hab. Panama, Trinidad, and British Guiana; doubtless more widely distributed.

(a) *Homoeopteryx malecena malecena* Druce (1886).

Oxytenis malecena Druce, l.c.

♂♀. Oblique line of upperside thin. Lobes of anal tergite of ♂ more or less strongly curved towards each other at apex.

Hab. Panama.

In Mus. Tring 1 ♂ from Chiriqui (from Staudinger).

In Mus. Brit. 1 ♂ from Bugaba, Chiriqui, type.

In Mus. Berol. (coll. Staudinger) 1 ♂, 1 ♀ from Chiriqui.

(b) *Homoeopteryx malecena prona* subsp. nov.

♂♀. Oblique line thicker than in the previous subspecies. In ♂ the two lobes of the anal tergite very slightly converging, also thicker in a vertical sense (Pl. xviii. figs. 13, 14).

Hab. Trinidad and British Guiana.

In Mus. Tring from Port of Spain, ii. 1897 (Dr. Percy Rendall), 1 ♂, type, and British Guiana, 1 ♀.

In Mus. Joicey from British Guiana, 1 ♀.

2. *Homoeopteryx major* spec. nov. (Pl. vii. fig. 15. ♂).

♂. Like *H. malecena*, but larger. Upperside wood brown, oblique line almost gallstone yellow on inside. Fringe of both wings chestnut. Underside strongly irrorated with blackish brown, submarginal line strongly crenate, edged with greyish white. Lobes of anal tergite as in *H. m. prona*, but stouter, basally wider, apically rather narrower. Penis-funnel (Pl. xviii. fig. 18) with broad obtuse processes. Eighth sternite (Pl. xviii. fig. 19) essentially as in *H. malecena*.

♀. Dark ochraceous shaded with russet, oblique line blackish brown with a brighter ochraceous proximal edge, space between this line and the crenate line darker, being shaded with russet brown, as is also the termen of forewing posteriorly and costal margin distally; as in ♂ some small grey markings outwardly edged with dark brown are indications of a subbasal, much broken, line. Underside clayish tawny, as in ♂ much irrorated with blackish brown, crenate line as in ♂. Fringe of both wings chestnut.

Antenna with only eleven distal segments ventrally enlarged, and the ventral surfaces of the enlarged portions much longer than broad. Genital sclerite as in *H. malecena*, but the apical margin projecting laterally as a short, broad, rounded lobe, and the antevaginal transverse ridge (Pl. xviii. fig. 12) more curved, its obtuse margin being rounded laterally and feebly incurved medianly.

Length of forewing: ♂, 40 mm.; ♀, 41 mm.

Hab. Peru.

In Mus. Tring 1 ♂, type, from S. Domingo, Carabaya, 6,000 ft., ii. 1902 (G. R. Ockenden).

In Mus. Joicey 1 ♀ from the same place, xi. 1904 (G. R. Ockenden).

Possibly a subspecies of *H. malecena*.

3. *Homoeopteryx syssauroides* Feld. (1874)

♀. *Homoeopteryx syssauroides* Felder, *Reise Novara, Lep. tab. 94. fig. 6* (1874) (no loc.); Kirby, *Cat. Lep. Het. p. 804* (1892) (hab. ?).

The type and only known specimen is without antennae and abdomen, but the legs prove it to be a ♀. There are three labels on the pin (we have replaced the pin, as it was corroded): one small, green, bearing the locality "Brésil"; this label was pressed close to the body and probably overlooked by Felder; the second label bears the name and the third a short description of the outline of forewing and the length of the abdomen. The abdomen which is now on the specimen is that of a Notodont, I think, and certainly does not belong to the specimen.

The Felders' figure is coarse, the submarginal blotches being much too pale and prominent; the last blotch of the forewing is more uniform in the specimen, and the second and third from the abdominal margin of the hindwing are larger than in the figure.

Upperside dark russet brown, the submarginal blotches pale ochraceous shaded with dark brown. The oblique line walnut brown, with a narrow grey outer edge, more distal than in the previous forms, reaching hindmargin just beyond middle on forewing and at middle on hindwing.

Underside russet hazel, the submarginal blotches paler than above, three on forewing, of which the one at tornus extends to near fringe; the brownish black line which bounds the band of blotches thick, on forewing straight, very faintly lunulate posteriorly, on hindwing distinctly lunulate.

Length of forewing: 36 mm. (probably, the apical lobe broken on both forewings).

Hab. "Brazil."

In Mus. Tring 1 ♀, type, ex coll. Felder.

4. *Homoeopteryx elegans* spec. nov. (Pl. vii. fig. 9. ♂).

♂. Body and upperside of wings cream colour, palpi and forelegs washed with ochraceous rufous, upperside of palpi dark brown, but tip of last segment creamy.

Forewing with a subbasal russet line from base of M^2 obliquely outward to hindmargin, curved basad at hindmargin, connected with a curved line in cell which runs from near base of M^1 obliquely basad to costal margin; at lower cell-angle a round deep brown spot, base and costal margin and a series of submarginal blotches cream-colour, rest of wing shaded with russet, disc more or less diffusely creamy, this colour accentuated on the veins; oblique line crossing hindmargin at three-fifths, clayish tawny, paler on basal side, on its outer side a greyish line and a dark brown one, both very thin, obsolescent, three large submarginal blotches cream-colour, slightly shaded with russet ochraceous, the two anterior ones bearing a black dot outwardly, in front of them two small spots, and between them and apex a thin creamy line; fringe walnut brown.—Line of hindwing submedian, reaching abdominal margin 11 mm. from base and 14 from anal angle, curved basad at costal margin; between it and base an oblique line from abdominal margin to cell, inclining basad; discal crenate line distinct, nearer to the submedian line than in *H. syssauroides*, the interspace between these two

lines russet ochraceous up to R^1 ; submarginal cream-coloured patches large, outwardly bounded from C to R^1 by a diffuse brown zigzag line, the last blotch by a heavier, slightly S-shaped bar, the two largest blotches bearing a black dot outwardly as on forewing; fringe walnut brown.

Underside of forewing russet with a distinct chocolate tint, base and hind-margin buff, submarginal blotches very prominent, pale buff yellow, the oblique blackish submarginal line which bounds them on the basal side straight.—Hindwing pale buff yellow slightly shaded with chocolate russet along costal margin; the elliptical patches united as a large pyriform band, bounded on the basal side by a black band which touches lower cell-angle, where it is 3 mm. broad, and becomes thin and crenulate towards costa; on the terminal side the pale yellow area is bounded by a row of black dots connected with each other by a diffuse line, which is zigzag anteriorly, obsolescent between R^1 and M^1 , and replaced by a Z-shaped bar before abdominal margin.

Genitalia (Pl. xix. figs. 1–7): Eighth sternite almost truncate, with a semi-circular sinus, the angles produced into a short spine. Sinus of anal tergite much deeper and narrower than in *H. malecena*, the lobes convergent in middle, divergent at apex, narrow, but not pointed. Apical lobe of clasper distinctly widened, rounded; process of harpe not widened at apex, which is also rounded. Penis-sheath slightly broadened apically, truncate, the right margin of the narrow membranous ventral space with two teeth which point towards the left. The lobes of the penis-funnel very short and broad, each nearly a rectangular triangle. Manubrium M (Pl. xix. fig. 5) of ninth sternite (= saccus) long, somewhat curved upwards at end.

Length of forewing: 39 mm.

Hab. Peru.

In Mus. Tring 1 ♂ from La Oroya, R. Inambari, 3,100 ft., ix. 1904 (G. R. Ockenden).

I thought at first that this specimen was the ♂ of *H. syssauroides*; it bears some resemblance to that species in the submarginal blotches of both wings being very prominent, but the differences between the two specimens are much greater than in the sexes of *H. malecena* and *H. major*. Moreover, in the ♂♂ of these species the crenate line of both wings, above, is farther away from the oblique line than in the ♀♀, whereas in *H. elegans*-♂ the interspace between these lines is narrower than in *H. syssauroides*-♀.

The specimen of *H. elegans* has the basis of the branches of the left (inner) side of the right antenna swollen.

5. *Homoeopteryx divisa* spec. nov. (Pl. viii. fig. 10. ♀).

♀. Bristles of antenna long, twelve segments with enlarged ventral surfaces counting from the third segment from apex, these ciliate surfaces a little broader than long except the proximal two, the segment previous to these with a conical ventral process as in the other species.

Upperside of wings russet walnut brown from base to oblique line, this colour very strongly contrasting with that of the terminal area, which is buff shaded with cinnamon rufous; oblique line of forewing cinnamon rufous, rather brighter than the proximal area, on its outside a thin grey line upon which follows a thin and somewhat diffuse dull walnut brown line, the grey line reaches

hindmargin at three-fifths; the submarginal rounded blotches not prominent, bounded on the proximal side by lunules which are much nearer the oblique line than in *H. malecena*, *H. major*, *H. syssauroides*, and even *H. elegans*; the last three blotches longer than broad, blotches R^1 - R^2 circular, and before them a small transverse spot, all these blotches bounded on the terminal side by dark brown bars or dots.——Median line of hindwing tripartite as the line of forewing, touching lower cell-angle and curving basad costally; submarginal blotches not quite so far distant from median line as in *H. syssauroides*, partly buff yellow, but not much contrasting with the rest of the terminal area, as the yellow colour is diffuse and extends to the margin except at costal and anal angles; a row of blackish dots indicates the outer boundary of the blotches; fringe dull walnut brown.

Underside pale dull hazel, pale orange buff from submarginal line to termen, this line thin, darker than the proximal area, slightly blackish on forewing and almost straight, at the proximal side of the line some grey shading from middle to apex, the line on hindwing slightly lunulate, at R^2 midway between cell and termen; on both wings the posterior angle suffused with hazel, some subterminal bars and spots diffuse, the two dots R^1 - M^2 of hindwing more distinct than the other spots.

Head, thorax, base of abdomen (rest of abdomen missing), and legs the colour of the proximal wing-area.

Length of forewing: 34 mm.

Hab. Bolivia.

In Mus. Joicey 1 ♀ from Mapiri (from Staudinger).

Key to the species of *Homoeopteryx*:

1. Oblique line of upperside of wings crossing hindmargin of forewing before middle 2
 This line crossing hindmargin of forewing at three-fifths 3
2. In ♂ underside feebly irrorated with dark brown, process of penis-funnel pointed; in ♀ 16 segments of the antenna ventrally enlarged 1. *H. malecena*
 Larger (length of forewing about 40 mm.), underside of both sexes strongly irrorated with brownish black; in ♂ processes of penis-funnel obtuse; in ♀ about 12 segments of the antenna ventrally enlarged 2. *H. major*
3. Body and nearly the whole upperside of hindwing cream-colour; forewing above with dark brown round discocellular spot 4. *H. elegans*
 Body and wings russet brown, the submarginal blotches conspicuous, ochraceous shaded with brown 3. *H. syssauroides*
 Wings russet walnut brown from base to oblique line, terminal area buff, strongly contrasting 5. *H. divisa*

The second family of aberrant Saturnioideans referred to on p. 135 comprises a few genera of the Chilean coast districts and one genus of the Andes, and differs from all the other Saturnioideans in the possession of an ancestral character in the neuration. This distinction has been entirely overlooked by all who have tried to define what constitutes a Saturnian.

Family : **CERCOPHANIDAE** fam. nov.

Costal vein of hindwing connected with cell by an oblique bar (Pl. xix. fig. 8), as is commonly the case in *Eupterotidae* and *Bombycidae*.

In the majority of the *Saturnioideae* the costal vein of the hindwing diverges from the cell from the base. But besides the *Cercophanidae* there are other exceptions ; for instance, among the *Agliinae* there occur a few species in which the costalis runs for a short distance parallel with the cell, then touches it (as in many *Lymantriidae*), and finally diverges from it very gradually.

The species united in this family fall into two groups, which have little in common besides the cross-bar.

A. Subfamily : **Cercophaninae** subf. nov.

A group peculiar in the imagines as well as the early stages.

Proboscis absent, its vestiges under the upper lip more or less scaled. Upper lip transverse, projecting, rounded in a dorsal aspect, its anterior margin obtuse or sharp. Third segment of palpus distinct. Frons with long hair, which hangs over the eye. Antenna bipectinate in both sexes, branches long and dorsal, but in the ♀ of one genus short and lateral, always bearing an apical bristle, ventral surface different according to species. Epiphysis of foretibia large in ♂, reaching to the apex of the foretibia, partly scaled, its inner edge incurved before middle, in ♀ reduced in width or altogether absent. Mid- and hindtibiae with a pair of short, claw-like, serrate spurs as in the bulk of the Saturnioideans ; tarsi with some spines on the ventral surface, particularly at the apices of segments I to IV ; claws serrate.

Neuration (Pl. xix. fig. 8) : In forewing the cell extending to near middle of wing, SC¹ from cell, SC² absent, SC³ off SC⁴ near apex of wing, stalk of SC⁴ about as long as the cell is broad ; R¹ from upper cell-angle or from subcostal stalk close to cell ; upper and lower cell-angles acute, about equal in size ; R² in or above centre ; apex of SM¹ coalescent with SM². Hindwing : no precostal vein ; cell longer than half the wing apart from tail, its upper angle very obtuse, lower angle acute, cross-vein D¹ being very oblique ; R³ from before centre ; SM³ absent.

Larva : only the last stage of two species known ; no prominent tubercles, some fine hairs, each segment with a long lateral hair thickened at the tip ; head small, thorax gradually increasing in width, the metathorax being the widest and being dorsally produced forward into a high peak ; preanal segment with a short peak directed backward ; a raised lateral line from peak of metathorax to tail.

Food-plants : *Aristolotelia*, *Tiliaceae* ; *Maytenus*, *Celastraceae*, *Cryptocarya* ; *Lauraceae* ; and *Hydrangea*, *Saxifrageae*.

Cocoon very hard, open at one end or at both ends, the edge of the opening smooth, recalling the larva-case of *Perophoridae*. Pupa of ♂ *C. venusta* with large antenna sheath, no legs showings, labrum almost circular, proboscis-sheath (in this case really the sheath of the labial palpi) broad, only half as long again as it is broad at base ; cremaster with or without spines.

Only four species are known, one of them being the smallest Saturnioidean described.

It is much to be desired that the first stages of the larvae should be studied.

As one of the species (*venusta*) is no great rarity in the neighbourhood of Valparaíso, there should be no difficulty in supplying the want.

In the first two genera the ♂♂ are tailed and the antennae of the ♀♀ have long pectinations; in the third genus the ♂ is not tailed, and the antenna of the ♀ has short lateral processes. The cocoon is open at the upper end in the first genus¹), and at both ends in the second; unknown of the third genus. Larva known of the first genus only.

1. Genus: *Cercophana* Feld. (1862).

♂. *Cercophana* Felder, *Verh. zool.-bot. Ges. Wien*, p. 496 (1862) (type: *frauenfeldi*); Kirby, *Cat. Lep. Het.* p. 765 (1892); Pack., *Monogr. Bomb. Moths*, iii. p. 26 (1914).

♂. *Eudelia* Philippi, *Ent. Zeit. Stettin*, xxv. p. 91 (1864) (type: *aristoteliae*); Kirby, *l.c.* p. 764 (1892).

♂♀. *Cercophora* (!) Feld., Butler, *Trans. Ent. Soc. Lond.* pp. 17, 103 (1882).

♂♀. Proximal segments of antennae not carinate beneath; branches long in both sexes, but much longer in ♂ than in ♀. Edge of labrum rounded off. ♂ tailed, in ♀ the tail represented by a short, broad, stumpy projection, which is sometimes almost effaced. Penis-sheath large, without armature; no anal sternite in ♂.

Larva recalling that of the African genus *Pselaphelia*, but in the latter the anterior conical horn is placed on the pronotum instead of the metanotum as in *Cercophana*, and the posterior horn of *Pselaphelia* is long and anal instead of short and preanal. In both species of *Cercophana* the larva is pale green, the head whitish green, the raised side-line yellow, or anteriorly blue and white and posteriorly yellow and rose colour. Very sluggish, clinging tightly to the food-plant. At rest the head almost hidden in the prothorax, pro- and mesothorax contracted and held downwards (cf. Edmonds, *Trans. Ent. Soc. Lond.* 1882, p. 103).

Cocoon open at the upper end, according to the specimens in the B.M., but said by Izquierdo to be hermetically closed; firmly fastened lengthways to a twig, on its outer surface a quite irregular network of silk threads glued on to the cocoon. Pupa moderately glossy, cremaster a small tubercle with hooked spines (Izquierdo), abdominal segments transversely and somewhat irregularly plicate in the region of the spiracles, no other prominent surface structure.

Hab. Chile, coast districts.

Two species.

1. *Cercophana frauenfeldi* Feld. (1862).

Cercophana frauenfeldi Felder, *Verh. zool.-bot. Ges. Wien* xxv. p. 496 (1862) (♂, Valparaíso); iid., *Reise Novara*, *Lep.* tab. 95. fig. 6, *Taf.-Erkl.* p. 3 (1874); Mab., *Miss. Cap Horn*, *Lép.* p. 11. no. 9 (1888) (Orange Bay—cocoon not this species); Kirby, *Cat. Lep. Het.* p. 765 (1892); Staud., *Hamb. Magelh. Sammelr.*, *Lep.* p. 51 (1899); Sonthon., *Essai Classif. Lép.* iv. p. 76. tab. 24. fig. 4. ♂, 5. ♀ (1904); Cock., in Pack., *Monogr. Bomb. Moths*, iii. p. 498 note (1914).

Cercophora (!) *frauenfeldi* Feld., Butler, *Trans. Ent. Soc. Lond.* p. 17. tab. 1. fig. 5. larva (1882) (Valparaíso, Feb.-March; descr. of ♀; food-pl. *Cryptocarya peumus*); Edmonds, *ibid.*, pp. 103, 104 (1882) (descr. of larva and cocoon); Bartl.-Calv., *An. Univ. Chile*, lxi. p. 15 (separ.) (1886).

Cercophana venusta ab. *frauenfeldi* Feld., Rothschild, *Nov. Zool.* ii. p. 47 (1895).

¹ Izquierdo, *An. Univ. Chile*, p. 40 (1895, issued 1896?), says that the cocoons are hermetically closed in *Cercophana* (and *Eudelia*). In the two cocoons in the B.M., from which the imagines have emerged, the upper end is widely open, the edges of the opening are quite smooth and do not at all look as if the opening had resulted from the emergence of the imago; it is only for this reason that I describe the cocoon of *Cercophana* to be open at the upper end; corroboration of Izquierdo's statement, as well as observations on the mode of emergence, would be most welcome.

♂♀. Clayish ochraceous buff, termen of forewing and anal area of hindwing, on upperside, washed with dark russet; lines of wings scalloped; no pale discocellular spot on forewing. Foretibial epiphysis present in ♀ as well as ♂, but much narrower in ♀.

Genitalia of ♂ (Pl. xxi. figs. 11, 12, 17): Anal tergite broad, entire at apex, gradually widening from apex to base, apex slightly curved downwards; a round median tubercle, in middle of apical margin of ninth tergite, and close to it at each side on tenth tergite, a short high ridge similar to a ribbed shell with dentate margin, the exterior side of these two projections concave. Clasper divided by a narrow ventral incision into two lobes, ventral lobe (H) elongate-triangular, with the apex rounded, apical lobe (Cl) very broad. Penis-sheath subcarinate ventrally; side-line of larva yellow, mesonotum and the three following segments with a pinkish median spot.—Food-plant: *Cryptocarya peumus*; larva found by Edmonds in November. Cocoon almost elliptical in outline.

Hab. Chile.

In Mus. Tring 1 ♂ (type) from Valparaiso.

In Mus. Brit. a pair and a cocoon from the same locality.

2. *Cercophana venusta* Walk. (1856).

Lonomia venusta Walker, *List Lep. Het. B.M.* vii. p. 1756 (1856) (♂, Chile).

Bombyx ? aristoteliae Philippi, *Linn. Entom.* xiv. p. 286 (1860) (♀, Valdivia, l. on *Aristotelia maqui*).

Eudelia rufescens Philippi, *Ent. Zeit. Stettin*, xxv. p. 91 (1864) (♂, Valparaiso, March); Maassen & Weym., *Beitr. Schm.* fig. 75. ♂, 76. ♀ (1881) (Valparaiso); Preiss, *Abbild. Nachtschm.* p. 8. tab. 11. fig. 1 (1888); Kirby, *Cat. Lep. Het.* p. 765. no. 2 (1892).

Eudelia vulpes Butler, *Trans. Ent. Soc. Lond.* p. 18 (1882) (♂, Coral, March); Kirby, *Cat. Lep. Het.* p. 765. no. 3 (1892); Bartl.-Calv., *An. Univ. Chile*, lxi. p. 15 (separ.), no. 124 (1886).

Eudelia venusta Walk., Butler, *l.c.* (Valparaiso, March; = *aristoteliae* = *rufescens*); Edm., *ibid.* p. 103 (1882) (descr. of larva and cocoon, on *Maytenus chilensis*); Bartl.-Calv., *An. Univ. Chile*, lxi. p. 15 (separ.), no. 123 (1886); Reed, *Act. Soc. Chile*, i. p. 68 (1892) (= *aristoteliae* = *rufescens*).

Eudelia aristoteliae Phil., Maassen & Weym., *l.c.* fig. 101. ♂, 102. ♀ (1885) (= *vulpes*); Kirby, *l.c.* no. 5 (1892).

Eudelia daphnea Maassen & Weym., *l.c.* fig. 103. ♂ (1895) (Chile ?); Kirby, *l.c.* no. 4 (1892).

Cercophana venusta Walk., Rothschild, *Nov. Zool.* ii. pp. 46, 47 (1895) (partim); Sonthon., *Essai Classif. Lép.* iv. p. 74. tab. 25. fig. 1. ♂, 2. ♀, 3. ♂, 4. ♂, 5. ♀ (1904).

Cercophana rufescens Phil., Packard, *Monogr. Bomb. Moths*, iii. p. 27. tab. 31. fig. 14. larva (1914).

Cercophana frauenfeldi Feld., Watson, in Packard, *l.c.* p. 498. tab. 111. fig. j. ♂ (1914) (Valdivia.—

This mistake in identification is due to the error in *Nov. Zool.* ii. p. 46).

♂♀. Varying from maize yellow to almost chestnut red, the majority of specimens more or less shaded with pink; postmedian line even, not scalloped; on forewing a conspicuous white discocellular spot margined with a brown line. Foretibial epiphysis absent in ♀. Tail of ♂ longer than in *C. frauenfeldi*.

Genitalia of ♂ (Pl. xxi. figs. 13, 16, 18): Anal tergite dorsally swollen, transversely corrugated, apex widened, broadly emarginate, divided into two lobes, which project oblique laterad and are longer than broad, with the sides almost parallel and the apex rounded. Clasper divided as in *C. frauenfeldi*, but the free lobe (H) of the ventral sclerite broader and shorter, and the apical lobe (Cl) longer than in that species. Penis-sheath with a conspicuous round swelling ventrally at the apex (Pl. xxi. fig. 16).—♀. Eighth tergite with the edge slightly more strongly chitinised than the previous segments, its scaling whitish, contrasting with that of the seventh segment; eighth sternite (= postvaginal sclerite)

a transverse, smooth plate with free apical edge, no tubercles, ridges, or other conspicuous prominences in the cavity between sternites vii. and viii., orifice central.

Larva larger than in *C. frauenfeldi*, the raised side-line pale blue above and white beneath on metathorax, replaced by three lines (blue, black, orange) on next segment, and pale yellow above and rose-colour beneath on the other segments; no pinkish dorsal spots, but a dorsal line paler green than the rest of the body (Edmonds).—Food-plant: *Maytenus chilensis* and *Aristotelia maqui*.

Cocoon larger than in *C. frauenfeldi*, distinctly pyriform, and more grey instead of yellowish. The irregular network of its outer surface blackish in the British Museum specimen, whereas in *C. frauenfeldi* it is the same colour as the cocoon.

Length of forewing: ♂, 32 to 37 mm.; ♀, 35 to 40 mm.

Hab. Chile.

In Mus. Tring 10 ♂♂, 7 ♀♀ labelled Chile, 1 ♂ Rancagua.

In Mus. Brit. two pairs (inclusive of type of *vulpes*) from Valparaiso and Coral.

2. Genus: *Neocercophana* Izquierdo (1896).

♂♀. *Neocercophana* Izquierdo, *An. Univ. Chile*, p. 36 (1895, but evidently issued 1896) (type: *philippii*).

♂♀. Very close to *Cercophana*; shaft of antenna sharply carinate beneath, the carina ending with a glossy apical cone on the distal segments; branches long in both sexes, but more especially in the ♂. Transverse margin of labrum sharp. Third segment of palpus longer than in *Cercophana*. Foretibial epiphysis long in both sexes, narrow in ♀; sole of fifth segment of foretarsus of ♀ with few scales. Underscales in proximal half of wings larger than in *Cercophana*, most of them with four teeth, long scales of fringe more deeply slit, nearly all with three teeth. ♂ tailed, in ♀ the termen of the hindwing incurved before middle, the tail being represented as in ♀ *Cercophana* by a broad rounded projection.

Larva not known. Cocoon open at both ends, fusiform, the top end gradually narrowing into a chord by which it is suspended from a twig of the plant; below the upper, elongate, opening a circular diaphragm with small central hole. Pupa with a projecting cremaster which is about twice as long as broad, widened apically, truncate, with the angles acute and projecting.

Food-plant: *Hydrangea scandens* Poepp. = *Cornidia integerrima* Hook. & Arn.

Hab. Chile.

One species.

1. *Neocercophana philippii* Izquierdo (1896).

Neocercophana philippii Izquierdo, *An. Univ. Chile*, p. 38. tab. 3. figs. 16. ♂, 17. ♀, 18. cocoon (1895, evidently issued in 1896) (Chillan, Araucania).

♂♀. Upperside dark burnt umber-brown, darker in ♂ than in ♀, proximal two-thirds of hindwing russet-hazel, terminal area of both wings and basal area of forewing more or less shaded with dispersed white scaling, particularly in ♂; on forewing an antemedian line and a discal one, and on hindwing a discal one even and more or less white, the discal line nearly parallel with termen.

Underside dark tawny in ♂, a duller russet tawny in ♀.

Genitalia of ♂ (Pl. xxi. figs. 14, 15, 19) : Tenth tergite divided to about two-fifths from apex into two lobes, which are directed distad, very slightly curved downwards, gradually and slightly narrowed apicad, obtuse, rather smaller than the sinus which separates them. The ventral portion (H) of the clasper ending with a narrow obtuse lobe, which is separated from the clasper (Cl) by a much wider sinus than in *Cercophana*, clasper longer than in that genus. Penis-sheath armed with spicules at the mouth.—♀. Postvaginal sternite membranaceous for the greater part, medianly slightly more chitinised, this portion rounded; cavity shallow and rounded; in front of the orifice, and forming the anterior wall of the cavity, a transverse smooth tubercle.

Early stages see above.

Length of forewing : ♂, 24 mm. ; ♀, 26 to 31 mm.

Hab. Chile (probably from about Chillan southward).

In Mus. Tring 2 ♂♂, 6 ♀♀ labelled Chile.

3. Genus : *Microdulia* gen. nov.

♂♀. Antenna with long branches in ♂ ; in ♀ the branches short and lateral (Pl. xix. fig. 10), the segments broader than long, the distal ones with a broadish apical ventral process which lies flat on the segment following and bears at the edge minute sensory cones. Epiphysis of foretibia absent in ♀. Hindwing without tail in both sexes, but termen slightly elbowed in ♂.

Early stages not known.

Hab. Chile.

One species.

1. *Microdulia mirabilis* Roths. (1895).

Cercophanu mirabilis Rothschild, *Nov. Zool.* ii. p. 46. tab. 10. fig. 6. ♂, 7. ♀ (1895) (Chile, in coll. Staudinger); Pack., *Monogr. Bomb. Moths*, iii. p. 28 (1914) (copy of R.'s descr. ; "probably the type of quite a distinct genus").

♂. Upperside of forewing dark russet tawny, with a darker discal line and a white discocellular spot, fringe spotted with yellowish white on both wings.—Hindwing orange, a discal line and a broad terminal band the dark colour of the forewing.

♀. Upperside of forewing buff, a transverse line before basal third, slightly incurved in cell, at right angles to hindmargin, widest at costal margin, outside it a less distinct line, posteriorly fading away, a broad line touching lower cell-angle, slightly curved in S-shape, also widest costally, and a thin scalloped discal line about parallel with termen russet tawny ochraceous, discocellular spot buff margined with russet tawny ochraceous, terminal area ochraceous buff; terminal margin somewhat undulated, spotted with buffish white on both wings.—Hindwing buff, without antemedian line, with a diffuse median line and an almost even discal line.

Genitalia of ♀ (Pl. xxi. fig. 20) : Orifice median and distal, the sclerite convex from orifice frontad, a sort of half cylinder being formed, sides of sclerite deeply concave.

Length of forewing : ♂, 20 mm. ; ♀, 22 mm.

Hab. Chile.

In Mus. Tring 1 ♀ from Chile.

2. Subfamily : **Janiodinae** subf. nov.

Proboscis strong, especially in ♂. Pilifer with bristles. Spurs of mid- and hindtibiae scaled to apex, only the extreme tip bare, strongly chitinised, claw-like. R^1 of forewing from cell, the cross-vein between it and the subcostal stalk almost longitudinal, the upper cell-angle therefore very obtuse ; SM^1 of hindwing present as in *Oxytenidae* and many other *Saturnioideae*.

One genus, the species of which recall the Old World *Eupterotidae* by the size, shape, and markings of the wings.

Early stages not known.

4. Genus : **Janiodes** gen. nov.

♂♀. Head and thorax shaggy. Palpus long, third segment somewhat porrect. Proboscis strong, rolled in, its papillae small, conical, pointed, restricted to the apical third of proboscis. Labrum slightly convex ; a deep hole at each side of it. Shaft of antenna compressed in both sexes, more or less strongly carinate beneath, at least the distal segments, proximal segments shorter than high, distal ones much longer than high ; ventral apical angle (with the exception of the proximal segments) produced, bearing a long glossy sensory cone, the process projecting considerably on the distal segments previous to the last ; all the segments (except the scape) bipectinate in ♂, the branches very long and slender, with one or two long apical bristles, a subapical dorsal one and usually one or more farther down the dorsal side, the branches subdorsal in origin on the proximal segments, dorsal on the distal segments, here the two branches of a segment originating quite close together ; in ♀ the antenna simple, shaft nearly as in ♂, in transverse section the distal segments triangular and the proximal ones ovate, the branches of the ♂ represented in ♀ by a slight lateral ridge which bears one or two long bristles (Pl. xix. fig. 9).

Epiphysis of foretibia non-scaled, reaching to apex of tibia in ♂, much reduced in ♀ ; fifth foretarsal segment of ♀ with scaling in centre ; soles of tarsi with spines, particularly in hindtarsus ; mid- and hindtibiae with one pair of spurs, of which the inner one or both are long (occasionally a small proximal pair present on hindtibia). Pulvillus larger than in *Cercophanidae*.

Wings different in outline in the sexes, without tail, in the ♂ broader and with the termen more rounded than in the ♀. Forewing with two or three black discocellular dots, often replaced by two large spots, of which the posterior one is the larger.

Neuration : In forewing four subcostals, SC^1 from cell long before apex (Pl. xix. fig. 8), SC^2 absent, SC^3 short, from SC^4 near apex of wing, SC^4 and SC^5 on a short stalk ; cross-vein D^1 between this subcostal stalk and R^1 almost longitudinal and fairly long, the upper cell-angle therefore very obtuse ; SM^1 forming a basal fork with SM^2 , its apex not free. In hindwing no precostal tubular vein, SC^2 and R^1 separate or stalked together (position individually variable) ; SM^1 vestigial or absent.

Genitalia of ♂ : Clasper large, entire or divided into two lobes, outer surface evenly chitinised, no distinctly separate ventral sclerite.

Early stages not known.

Hab. Andes, from Colombia to Bolivia.

Genotype : *Janiodes laverna* Druce (1890, as *Oxytenis*).

The species of this genus were mostly described as *Oxytenis* and *Lonomia*. The peculiar Eupterotoid basal neuration of the hindwing removes them at once from both these genera.

1. *Janiodes laverna* Druce (1890) (Pl. vi. fig. 11. ♂, 12. ♀).

♀. *Oxytenis laverna* Druce, *Proc. Zool. Soc. Lond.* p. 502. tab. 43. fig. 5 (1890) (Ecuador).

♂. *Oxytenis nigropuncta* id., *Ann. Mag. N.H.* (7). xvii. p. 411 (1906) (Peru).

The largest known species of the genus, individually so variable that Strand gave six names to the six males which were before him (cf. *J. laverna nigropuncta*). The majority of specimens have on the forewing two small black discocellular spots, while in a minority these spots are more or less strongly enlarged, the lower spot having sometimes a diameter of 5 to 6 mm.

♂. Upperside varying from clayish buff to blackish sepia-brown, shaded with greyish white scaling, which usually is concentrated on the veins, forming discal streaks; for markings of upperside cf. Pl. i. fig. 11; the nearly straight proximal postmedian line of this figure not always distinct and in the northern race more undulate.

Underside much shaded with cinnamon-rufous; across both wings, parallel with the termen, a more or less diffuse band varying from ferruginous to orange-buff and even buff, and bearing a darker zigzag line corresponding to a similar line of the upper surface.

♀. Upperside buff or orange-buff, in the specimen figured (Pl. i. fig. 12) the central third of the forewing, the base and termen, and on hindwing the basal three-fifths from abdominal margin to cell, russet and russet-tawny; lines essentially as in ♂, but shape of wings different (cf. figure).

Underside orange-buff, shaded with ferruginous, in outer half two conspicuous undulate lines and a subterminal, diffuse, band deeper brown.

Genitalia of ♂ (Pl. xix. figs. 11-17): Anal tergite with a very strongly compressed apical process which is channelled along its narrow dorsal surface, the dorsal outline in a lateral aspect being almost semicircular. Clasper with a broad, rounded, median, ventral lobe, and a large pointed apical lobe which, in a view from the outer side, appears claw-shaped, but in reality is broad to near apex and then gradually narrowed to form a hook; manubrium of ninth sternite (= saccus) short and broad. Penis-funnel (P.-F.) formed by a prominent sclerite, concave on upperside (adapted to the penis-sheath, which lies above it) and convex below, the apex sinuate and denticulate, with the angles projecting distad, and the base shallowly impressed. Penis-sheath without teeth, the apex produced ventrad. Above the penis-sheath a transverse ridge which runs frontad at the sides.—♀. The larger distal half of the postvaginal sclerite membranous (Pl. xxi. fig. 10); the cavity proximal, bounded in front by a minutely serrate ridge concealed under the margin of the external, scaled, seventh sternite; from the cavity, on each side, a ridge runs obliquely outward and backward, and a second, lower, ridge, parallel with the first, is placed a little farther anad; in and behind the cavity the surface irregularly wrinkled.

Length of forewing : ♂, 36 to 48 mm. ; ♀, 45 to 48 mm.

Early stages not known.

Hab. Colombia to Bolivia.

Two subspecies.

(a) *Janiodes laverna laverna* Druce (1890).

♀. *Oxytenis laverna* Druce, l.c. (1890) (Intaj, Ecuador); Kirby, *Cat. Lep. Het.* p. 770. no. 11 (1892) (Ecuador).

♂. *Lonomia pulverosa* Strand, *Arch. Naturg.* lxxviii. A. 9. p. 150 (1912) (Macas, Ecuador); id., in *Lep. Niepelt.* i. p. 18. tab. 4. fig. 12 (1914) (Macas).

♂♀. In both sexes the first discal line of the forewing above undulate. Three of the four specimens (2 ♂♂, 2 ♀♀) which we have seen of this subspecies have large black discocellular spots on the forewing, and the ♂ in coll. Joicey has in addition a small round black discocellular spot on the hindwing; the second ♂ (in coll. Dognin) has a narrow discocellular bar on the forewing, accentuated at the ends.

Hab. Colombia; Ecuador.

In Mus. Joicey from San Antonio, West Colombia, 5,800 ft. (G. M. Palmer), 1 ♂, and Intaj, Ecuador (Buckley), 1 ♀, type.

In coll. Paul Dognin from Alto de las Cruces, West Cordillera, Colombia, 2,200 m. (A. H. Fassl), 1 ♂; Aquadila, Bogotá, vi. 1918 (Fassl), 1 ♀.

(b) *Janiodes laverna nigropuncta* Druce (1906) (Pl. vi. figs. 11. ♂, 12. ♀).

♂. *Oxytenis nigropuncta* (!) Druce, l.c. (1906) (Oconeque, S.E. Peru, 7,000 ft.).

♂. *Lonomia pulverosa* abs. *pauperata*, *desquamata*, *macromacula* (!), *duplinota*, *contrastata* Strand, *Arch. Naturg.* lxxviii. A. 9. p. 150 (1912) (Chanchamayo; Chaco, Bolivia).

♂♀. Proximal discal line of upperside of forewing straight, at least from centre to hindmargin; this line indistinct in ♀, as it is in ♀ of the previous subspecies.

Hab. Peru; Bolivia.

In Mus. Tring from Peru: Huancabamba, N.E. of Cerro de Pasco (E. Böttger), 6 ♂♂; S. Domingo, Carabaya, 6,000 ft., iii. iv. 1902, and La Oroya, R. Inambari, Carabaya, ix. 1904 (G. R. Ockenden), 2 ♂♂, 1 ♀.

In Mus. Joicey from Peru: R. Tono, Central Peru, 1,200 ft. (Watkins), 1 ♂; Oconeque, Carabaya, 7,000 ft. (G. R. Ockenden), 1 ♂, type.

Also in coll. Paul Dognin from Huancabamba.

2. *Janiodes dognini* spec. nov. (Pl. viii. fig. 6. ♂.)

♂. Body and wings greyish drab. Frons dark reddish brown, palpus dark ferruginous, tarsi beneath buffish, foretibia blackish brown, shaft of antenna pale ochraceous buff.

Upperside of forewing for the greater part shaded with dispersed bluish silvery white scales, which are slightly glossy in sunlight; at upper and lower cell-angles a minute dark chocolate spot and between them and also on the proximal side of the posterior spot some dots of the same colour, all these small markings bordered with white; a line about $\frac{1}{2}$ mm. broad commences at costal margin nearly 9 mm. from base, slightly angulate at C and then almost straight to hindmargin, which it reached 6.5 mm. from base; before apex of cell a second conspicuous line excurved below costal margin, incurved in cell, angulate just outside base of M^1 and further postically slightly incurved; on the proximal side of this line at a distance of nearly 2 mm. from it a less prominent line of the same shape; outside cell another line, well marked, thinner towards costa than posteriorly, excurved below costa and then straight to hindmargin, the median interspace, which bears the discocellular dots, 5 mm. broad at costal margin and

3 mm. at hindmargin ; outside this line at a distance of 1 mm. from it a fainter line parallel with it and anteriorly slightly undulate ; then follows at the same distance a very faint line ; and halfway between the prominent discal line and the termen a thin but very distinct regularly undulate line which is partly outlined in buff on the outer side ; at termen a diffuse white line and an indication of a short white submarginal line at apex ; all the other lines Vandyke brown ; fringe hazel brown.—Hindwing similar to forewing ; the median interspace 2.5 mm. broad at abdominal margin, somewhat silvery up to cell and bounded on the basal side by the antemedian line, which extends only to the cell, on the proximal side of this line, at the abdominal margin traces of two other lines ; discal line somewhat rounded-excurved in middle, touching lower cell-angle and then slightly incurved ; on its outer side, parallel with it, two slightly undulate vestigial lines, and as on forewing a regularly undulate line in terminal area ; fringe and diffuse white scaling along it as on forewing.

Underside drab, both wings without line in basal half, with a minute blackish discocellular dot ; in outer half a Vandyke brown discal line much less distinct than above, faintly undulate, on forewing fading away posteriorly, outside it a faint trace of a line, and in terminal area a crenate-undulate line, fainter than the corresponding line of the upper side and bounding a diffuse ferruginous band which, on the forewing, is distinct only at apex of wing, whereas on the hindwing it is fairly conspicuous from near costal margin to near abdominal margin.

Neuration as in *J. laverna*.

Genitalia (Pl. xix. figs. 13–15) : Tenth tergite less strongly compressed than in *J. laverna*, its dorsal surface broader, considerably widening proximally and produced at each side of the median channel into a short broadish lobe which projects frontad ; in a lateral aspect the apical portion of the sclerite much more abruptly curved downward than in *J. laverna*. Clasper with the proximal lobe narrower than in *J. laverna* and less rounded, and the distal lobe much less acuminate than in that species ; on the inside, as a continuation of the posterior margin of the proximal lobe, a rather high transverse ridge which bears a row of small spiniform teeth at the side towards the penis-funnel. Penis-sheath large, without armature.—Specimen not dissected ; the above particulars obtained by relaxing the claspers and bending one of them sideways.

Length of forewing : 32 mm.

Hab. Colombia.

In coll. P. Dognin 1 ♂ from Monte Tolima, Central Cordillera, 3,200 m. (A. M. Fassl).

3. *Janiodes ecuadorensis* Dogn. (1890) (Pl. viii. figs. 5. ♀, 11. ♂, 15. ♂).

♂. *Oxytenis* (?) *ecuadorensis* Dognin, *Le Natural*. xii. p. 50 (1890, February) (Loja) ; id., *Lép. Loja*, p. 54. tab. 5. fig. 7 (1891) ; Kirby, *l.c.* p. 770. no. 12 (1892) (Ecuador).

♂. *Nephodia* (?) *monacharia* Maassen, in Stübel, *Reis. S. Amer., Lep.* p. 47. no. 15. p. 162. no. 161, tab. 5. fig. 16 (1890, October) (Pichincha, Ecuador).

♂. *Oxytenis monacharia* Maass., Kirby, *l.c.* p. 935 (1892) (Ecuador).

♂. *Lonomia monacharia* Maass., Druce, *Ann. Mag. N.H.* (7). xiii. p. 247 (1904).

♂. *Oxytenis ecuadorensis* var. *flexuosa* Dognin, *Hét. Nouv. Amér. Sud.* ii. p. 51 (1911) (Monte Socorro, 3,400 m., près Cali).

♂♀. *Oxytenis ecuadorensis* Dognin, *ibid.* p. 51 (1911) (Colombia, ♀ with simple ant.).

♂. Upperside blackish sepia-brown shaded with fawn, thorax dull ferruginous chocolate ; before middle of forewing a band of lines curved from costal

to hindmargin, indented on the veins, a grey line separating the two outer dark lines, and the inner line being often bounded on the basal side by ochraceous clay-colour, this colour sometimes forming a broad antemedian band; on disc at one-fourth to two-fifths from lower angle of cell a nearly straight, sometimes curved, sometimes undulate, triplicate line from costa to hindmargin, the proximal and the discal lines dark brown separated by a grey line; a dark brown submarginal crenate line accentuated by short buff dashes on the veins, usually a buff spot in the arch M^1-M^2 of the crenate line.—The discal and crenate submarginal lines continued across hindwing in most specimens, sometimes the hindwing without markings; russet in basal half and blackish brown distally.

SC^1 from ocell or stalked with R^1 .

Pl. viii. fig. 15 represents the type-specimen from coll. Dognin.

Underside Vandyke brown (Ridgway, *Nomencl. Colours*, iii. 5), an obsolescent discal line double, brown and grey, often only the grey line present, and sometimes both missing; a crenulate submarginal line distinct, or only indicated by a row of vein-dots, or absent; veins in terminal area of both wings more or less cinnamon.

♀. Much paler than the ♂. Head smaller. Wings much narrower and longer, termen more oblique, abdominal margin of hindwing shorter than costal margin.

Genitalia of ♂ (Pl. xx. figs. 1–6; xxi. fig. 7): Process of anal tergite much broader than in *J. laverna*, the edges considerably raised on the dorsal side, broadly concave along middle, the process resembling the spout of a jug. Clasper broad and short, triangular, with the apex rounded; no separate harpe, no ventral process. Penis-sheath thicker than in *J. laverna*, the base (= foot) longer, the apical ventral dilatation shorter, the membrane of the orifice with a patch of short spines. Penis-funnel (P-F) continued anad at the sides of the penis-sheath and terminating with a pointed process each side; above each process a broad lobiform sclerite.—♀. The genital cavity bounded in front by a plicate ridge, the inside of the cavity smooth, but behind it the sclerite convex and transversely plicate (Pl. xx. fig. 16), this portion of the sclerite appearing very dark.

Length of forewing: ♂, 29–32 mm.; ♀, 34 mm.

Early stages not known.

Among the ♂♂ occur specimens (Pl. viii. fig. 11) which are a little larger (forewing 33 to 34 mm.), and have a broad ochraceous clay subbasal band on the forewing, the discal line undulate, and the terminal area (of forewing) for the greater part clay-colour. This is *ab. flexuosa* Dogn., l.c. I do not see any difference in structure. We have a specimen of it from San Antonio.

Hab. Colombia; Ecuador; Peru.

In Mus. Tring from Colombia: San Antonio, Western Cordillera, 5,800 ft., xi. xii. 1907 (G. M. Palmer), 3 ♂♂; Cañon del Tolima, Central Cordillera, 1,700 m., iii. 1910 (A. H. Fassl), 1 ♂ (slightly different in anal tergite). Peru: Huanca-bamba, 6,800 ft. (E. Böttger), 4 ♂♂.

In Mus. Joicey from Colombia: San Antonio (G. M. Palmer), 1 ♂.

In coll. Paul Dognin from Colombia: San Antonio and Rio Aguaca, 2,000 m., Cauca and Monte Tolima (A. H. Fassl), a small series of both sexes; *ab. flexuosa* from Monte Socorro near Cali, Cauca.

4. *Janiodes russea* Dogn. (1912) (Pl. vi. fig. 13. ♂; viii. fig. 8. ♂, type).

♂. *Oxytenis russea* Dognin, *Hét. Nouv. Amér. Sud*, ii. p. 50 (1912) (Colombia: San Antonio, 2,000 m.; Alto de las Cruces, near Cali, 2,300 m.).

♂. More reddish russet than *J. ecuadorensis*; subbasal area of forewing proximally of and in between antemedian lines more or less russet ferruginous; markings as in *J. ecuadorensis*, but the distal one of the antemedian lines nearer apex of cell. Termen of both wings undulate.

Genitalia (Pl. xx. figs. 7-12; xxi. fig. 8): Anal tergite with three apical processes instead of one, the median process ventral, setiferous, pyramidal, directed downward, the other two dorsal, flattened, separated by a narrow sinus, their inner margins parallel, the outer margins rounded. Clasper very broad, divided by a broad round apical sinus into two rounded lobes, of which the upper one is slightly the shorter and broader. Penis-sheath hardly at all dilated ventrad at apex, subapically on the left side with a large tooth and close to it some small teeth, and on the right side with a patch of minute teeth placed on a swelling. Penis-funnel (P-F) with a ventral bifid sclerite, broader at the base of the sides than long, the sides slanting and the ventral surface deeply impressed proximally; from this sclerite anad extends on each side a ridge, the two ridges connected at same distance from the anus by a low transverse sinuate ridge, the upper angles of the lateral ridges projecting.

Length of forewing: 27 mm.

♀ and early stages not known.

Hab. Colombia.

In Mus. Tring from: Monte Tolima, 3,500 m., ii. 1910 (A. H. Fassl), 1 ♂.

In Mus. Joicey from: San Antonio, Western Cordillera, 5,800 ft., xii. 1907 (M. G. Palmer), 1 ♂.

In coll. Paul Dognin from: San Antonio, 2,000 m., xi., and Alto de las Cruces, near Cali, 2,300 m., iii. (A. H. Fassl), several ♂♂.

5. *Janiodes virgata* spec. nov. (Pl. viii. fig. 9. ♀).

♀. Antenna and abdomen missing. Head and thorax above and beneath raw umber colour with a chestnut tint.

Upperside of forewing drab brown (Ridgway, *Nomencl. Colours*, iii. 18), shaded with white, and with mummy-brown transverse bands which are devoid of scattered bluish white scaling: a trace of such a band 3 mm. from base, three broad lines separated from each other by two thin white lines form a broad antemedian band 6 to 7 mm. wide, almost straight from costal to hindmargin, being costally very slightly curved basad, its inner margin anteriorly 7 mm. from extreme base and posteriorly 6 mm., its outer margin crossing cell proximally of point of origin of M^1 ; no black discocellular dots; median interspace of wing at costa about 5 mm. wide, at hindmargin 4 mm., bounded by a straight band about 3 mm. broad and divided lengthwise by two thin white lines which are close together and of which the outer one is obsolescent (like the inner one of the antemedian band), the brown band being composed of three brown lines of which the proximal one is as broad as the two others together; then follows a thin crenate line; termen without distinct white scaling; fringe mummy brown;

margin entire, slightly incurved below apex, tornus broadly rounded, without indication of an angle.—Hindwing triangular, with the apex and tornus rounded off, costal margin as long as abdominal margin, termen entire, straight in middle; pale mars-brown (i.e. fawn-colour with a walnut-brown tint) from base, the termen shaded with mummy brown, no markings.

Underside of forewing pale drab, nearly fawn-colour, shaded with ferruginous, veins and costal margin ferruginous, a faint trace of a ferruginous discal line.—Hindwing ferruginous from base to discal line; this line deeper ferruginous, about 1 mm. broad, parallel with termen, but more evenly curved, 8 mm. from termen, outside it a faint trace of a scalloped line, terminal area shaded with pale drab, veins ferruginous; fringe blackish as above.

Neuration: In forewing R^1 not from cell, but from stalk of subcostals; in hindwing R^1 from cell, lower cell-angle less than 90° .

Length of forewing: 30 mm.

Hab. Colombia.

In coll. P. Dognin 1 ♀ from Paramo del Quindiu, Central Cordillera, 3,800 m. (A. H. Fassl).

6. *Janiodes bethulia* Druce (1904) (Pl. vi. fig. 13. ♂; viii. fig. 7. ♂, type).

♂. *Lonomia bethulia* Druce, *Ann. Mag. N.H.* (7). xiii. p. 247 (1904) (Huancabamba, 6,000–10,000 ft.).

♂. Similar to *J. ecuadorensis*; forewing partly with a cinnamon-rufous or chestnut tone, the antemedian lines less curved, discal triplicate line very straight, touching lower cell-angle or nearly, three brown discocellular dots, submarginal undulate line very distinct, a band in between the antemedians and proximally of them as well as the two-thirds or three-fourths of the termen dirty ochraceous or yellowish cinnamon.—Ground-colour of hindwing as on forewing, variable in the depth of the brown tint; discal line close to cell, often crossing lower cell-angle, much less distinct than on forewing, submarginal undulate line vestigial or obsolete.

Genitalia (Pl. xxi. figs. 1–6, 9): Anal tergite with a broad flat apical lobe which is about half as long again as broad and evenly rounded at apex; it bears on the upperside from base to near apex an obtuse high median crest which is highest towards its distal end, being here strongly rounded in a lateral aspect. Clasper very broad and obtuse, entire. Penis-sheath dorsally on each side with a subapical, somewhat rounded, minutely denticulate process which is convex on the outer side and partly concave on the inner side, being curved towards the sheath; apical portion of the sheath beyond these processes longitudinally plicate. Penis-funnel (P-F) deeply divided into two long horns, the lateral margins of which are each continuous with a longitudinal ridge, which ends with a large, apically rounded, somewhat twisted flap, the two flaps contiguous, well projecting above the concave area which lies between them and the anus.

Length of forewing: 25 to 27 mm.

♀ and early stages not known.

Hab. Peru.

In Mus. Tring from: Huancabamba, 6,000–10,000 ft. (E. Böttger), 2 ♂♂.

In Mus. Joice from the same place, 2 ♂♂, incl. of type.

Key to the species :

1. Termen of wings entire ; anal tergite of ♂ not divided 2
 Termen of wings undulate ; anal tergite of ♂ divided *J. russea*
2. Proximal discal line costally as strongly curved basad as the distal antemedian line ; anal tergite of ♂ strongly compressed 3
 Discal line not distinctly curved basad from upper radial vein to costal margin ; anal tergite of ♂ not compressed 4
3. Distal antemedian line of forewing incurved in cell, discal line close to lower angle of cell ; anal tergite of ♂ dorsally towards base with a double, heart-shaped, projection *J. dognini*
 Proximal discal line of forewing distant from lower angle of cell ; anal tergite of ♂ without a dorsal basal projection *J. laverna*
4. Discal line of both wings close to lower angle of cell ; anal tergite of ♂ broad, flat, with a high median crest, apex round *J. bethulia*
 Discal line of both wings farther away from cell, less prominent and less straight on forewing, antemedian lines more strongly curved ; anal tergite of ♂ longitudinally concave above, with the lateral margins turned up, recalling the spout of a jug *J. ecuadorensis*
 Dark antemedian and discal lines broad and straight (♀) *J. virgata*



THE BIRDS OF NEW HANOVER.

By ERNST HARTERT.

NEW HANOVER (Neuhannover), with the exception of the Admiralty Islands and St. Matthias Island, the northernmost bigger island of the Bismarck Archipelago, is about 37 miles in length by about 20 miles in breadth, and consists of a mountainous ridge averaging in height from about 1,000 to 2,000 feet, and is about 1,476 square kilometres in size. It is said to look very beautiful from the sea, being to a large extent covered with luxurious forest.

The ornithology of New Hanover has hitherto been imperfectly known. A few specimens were collected by various explorers and sailors, since Dr. Hüsker obtained some species there in 1875 (cf. *Journ. f. Orn.* 1876, pp. 319–330), but the first collector who made a larger collection of birds on the island was Cayley Webster, who visited it in February and March 1897. I gave a list of the species collected by him on pp. 369–375 of his book *Through New Guinea and the Cannibal Countries* (sic), London 1898, and an additional one of seven species, pp. 138, 139 of the *Ornithol. Monatsberichte* 1899, together with Dr. Walter Rothschild (now Lord Rothschild). Webster discovered some remarkable new forms: *Micropsitta finschii viridifrons*, *Cacomantis sepulchralis websteri*, *Alcyon websteri*, *Eurystomus orientalis neohannoveranus*, *Munia nigerrima*, and *Hypotaenidia philippensis lesouefi* (Mathews) was also described from Webster's specimens. But Webster was not a very experienced collector and did not send many small birds. I therefore expected that, if a collector of the experience of Albert F. Eichhorn visited New Hanover, he would discover as many new forms again. In February 1923 Mr. Albert S. Meek installed Eichhorn on New Hanover, and he sent a collection of beautifully prepared skins. He obtained all the species found on New Hanover before and a number which were hitherto unknown on that island, but not so very many more Passerine birds, of which only two have here been separated as new: *Rhipidura rufiventris albertorum* and *Lalage karu albidior*.

Dr. Heinroth (*Journ. f. Orn.* 1903, p. 99, map p. 101) and others have already called attention to the interesting fact, that some birds from New Ireland differ strikingly from those of New Britain, though these two islands are on the narrowest place only 33 km. distant from each other, and the Duke of York group and other small islands lie in between in the wider part of the straits. Exactly the same can be said of New Hanover, the distance between the latter and New Ireland being very much the same, and there are a number of islets interspersed in between the nearest points. Nevertheless a number of birds are so far only known to occur on New Hanover, and most of these are represented by other forms on New Ireland. The greater number of birds are naturally the same as those on New Ireland, and some are spread over all the larger islands of the Bismarck Archipelago. The large island of New Ireland is probably not quite fully explored, but collections have been made on various points. Of New Britain only the northern part of the northern peninsula, the Gazelle-Halbinsel, is well known. Of the greater portion, with some high mountains and

extensive forest, almost nothing is known, and what Heinroth said in 1903 (*Journ. f. Orn.* p. 100) is still perfectly true. After all the collecting done on the Gazelle Peninsula by Fergusson, Brown, Hüsker and Studer, Hübner, Richards, Kleinschmidt, Kubary, Geisler, Parkinson, Dahl, and Heinroth, this part of New Britain should be well known, yet Mr. C. Wahnes discovered near Massawa the remarkable pigeon *Henicophaps foersteri* Rothsch. & Hart. (*Bull. B.O. Club*, xix. p. 28, 1906), figured *Nov. Zool.* 1911, pl. i. This striking large bird was also collected by Bley and Father Meyer near Toriu and Kambaira, and by Dr. Hahl between Kambaira and the Baining Mountains (see *Nov. Zool.* 1911, p. 168), all places in the Gazelle Peninsula!

For a review of all the birds of the Bismarck Archipelago up to date see Reichenow, *Mitt. Zool. Samml. Museums Berlin*, i. 3, 1899, and Dr. Dahl's biological observations, also Heinroth's articles in *Journ. f. Orn.* 1902 and 1903. A list of some birds from the Bismarck Archipelago by the late Mr. Martens is also given in the *Archiv für Naturgeschichte*, lxxxviii, A, Heft 7, 1922, but the collector of these birds was chiefly occupied with other zoological work, and his collection does not add much to our knowledge of the ornithology of these islands.

1. *Megapodius duperreyi* eremita Hartl.

Megapodius eremita Hartlaub, *Proc. Zool. Soc. London*, 1867, p. 830 (Echiquier Islands, north of New Guinea, north-west of Admiralty Islands—not Bougainville in the Solomon group!)

1 ♂, 2 ♀, February and March. "Iris brown. Bill dull grey, blackish at base. (Bare skin on forehead of male red.) Feet greenish black."

There seems to be no difference between the birds from Manus (Admiralty group), Rook Island, and Vella Lavella, Isabel, and Rendova in the Tring Museum. We have, however, no Chess-board (Echiquier) Islands specimen.

The males are generally much larger than the females; the wing of the former ranges over 220 up to 235, those of the latter 205 (once) and 210 to nearly 220 mm.

The New Hanover birds have been described as *Megapodius hueskeri* Cab. & Rehw. 1876, who were unaware of *M. eremita*. Again, Sclater in 1877 named the Admiralty Islands bird *M. rubrifrons*, saying that it had "dark legs," which appears the only difference from *eremita*; as *eremita* was also described as having "dark legs," I suppose he read the wrong description, of *M. senex*, on the same page. In 1870 Gray named the form of the Solomon Islands *M. brenchleyi*!

2. *Numenius phaeopus variegatus* (Scop.).

♂♀, 23.iii.1923.

3. *Tringa hypoleucos* L.

♀, 11.iii.1923.

4. *Charadrius dominicus fulvus* Gm.

♀, 13.iii.1923.

5. *Hypotaenidia philippensis lesouefi* (Mathews).

Eulabeornis philippensis lesouefi Mathews, *B. Australia*, i. p. 198 (1911—New Hanover).

2 ♂, 3 ♀, February and April. "Iris brown, reddish brown, burnt sienna. Bill brown and reddish brown. Feet greyish brown." This is a very dark and

somewhat short-winged subspecies. The hind-neck is deep chestnut, the upper back is black, just behind the chestnut portion it is cross-barred with white, on the back spotted with the same colour; the pectoral band is wide and uninterrupted in one specimen, in the others less broad, and more or less interrupted. The breast-feathers are black with three or two white bars, and the wings measure 135–142 mm. This form is evidently not restricted to New Hanover. Mathews says that New Britain specimens belong to it, and we have one from the "Giriuru" (?) River in British New Guinea, shot 5.x.1907, and another collected by Albert F. Eichhorn at Botoli, China Strait (between the south-eastern point of New Guinea and Samarai and Basilisk Islands), 19.viii.1922, which are exactly like the New Hanover form; specimens reported from New Ireland and Duke of York Islands also probably belong to it. Mathews says that *H. p. lesouefi* is nearly as dark as his *H. p. swindellsi* from New Caledonia, but three New Caledonian specimens now at Tring are very much less dark, having the back brown and not black, and more white bars on the breast; their bills may also be bigger, if this is constant.

6. *Ducula (Globicera) rubricera* (Bp.).

Globicera rubricera Bonaparte, *Compt. Rend. Acad. Paris*, xxxix. p. 1073 (1854—New Ireland. Name ex Gray MS. in Mus. Brit. This article was communicated to the meeting of the Academy Dec. 4th; Mathews says this part of the Proceedings was published "about Dec. 11th." If that is so, it was remarkably quick work indeed! Though the date on the sheet of the *Consp. Gen. Av.* does not prove the date of its publication, there seems to be no absolute certainty which paper was published earlier, and I quite believe that it was the one in the *Compt. Rend.*, and as author, diagnosis, and locality are the same, it does not matter in the least).
Carpophaga (Globicera) rubricera Bonaparte, *Consp. Gen. Av.*, ii. p. 31 (vol. dated 1857, sheet with p. 31 dated 8 Nov. 1854—New Ireland).

(There is no reason whatever to suppose that this species has occurred in Australia: when Cassin described his *Carpophaga lepida*, which is evidently *D. rubricera*, he clearly said that the specimen was purchased "in Europe" and that its locality was doubtful.)

8 ♂♀, March and April. "Iris dark red. Bill blue and black. Feet dark plum red." The frontal knob is red. Males and females are alike.

7. *Ducula rhodinolaema* (Sel.).

Carpophaga rhodinolaema Selater, *Proc. Zool. Soc. London*, 1877, p. 555 (Admiralty Islands).

♀ ad., New Hanover, 30.iii.1923. "Iris dark red. Bill slate-blue. Feet cherry red."

This specimen is a typical *rhodinolaema*, exactly agreeing with series from Manus and Rook Islands.

I have formerly recorded two specimens from Egum, east of the Louisiades, and one from St. Aignan, Louisiade group, as *D. vanwycki*, but this was not correct. *Ducula rhodinolaema* has the upperside, from the interscapulum backwards, metallic blue-green, while in *D. vanwycki* this colour is greyish-green with golden reflections, as if with a mealy "bloom." Dahl stated that *D. vanwycki* inhabited in numbers the Credner Islands and Massawa, which were separated by the northern peninsula of New Britain, but was not found on New Britain, being peculiar to the smaller coral islands with large trees. This is probably correct, as far as New Britain is concerned.

The British Museum has several *D. vanwycki* from Duke of York Island.

both from the Rev. Brown and C. L. Layard, and one from Kleinschmidt, also one from the Credner Islands, from Th. Kleinschmidt. The specimen from Goldie, labelled "Port Moresby," enumerated as *D. vanwycki* in the *Cat. B. Brit. Mus.* xxi. p. 197, is not *vanwycki*, but of this later!

Typical *D. rhodinolaema* is in the British Museum only from the Admiralty Islands. We have it from Manus (Admiralty Islands), Rook Island, and one from New Hanover, also one labelled "Massawa, Neupommern, October 1895, C. Wahnes coll. "; this specimen has no original Wahnes label, but one written by the late Professor Förster, from whom we bought it. It is strange that it should come from Massawa, where Dahl only found *vanwycki*. We have also one from Konstantinshafen (Kubary coll.); there are also specimens from there, from Stephansort and Jombaffluss in Berlin.

Then there are the specimens erroneously called *D. vanwycki* from the south-eastern Papuan Islands: two from Egum, one from St. Aignan, one Port Moresby—the latter locality undoubtedly incorrect, all localities of Goldie being doubtful; they had no original labels and were mostly said to come from the Owen Stanley Mountains or Port Moresby, while a number came from the D'Entrecasteaux Islands—so probably this pigeon came from thereabouts as well.

Now most of these specimens formerly called *vanwycki*, which, however, from their colour, are *rhodinolaema*, are smaller than the typical *rhodinolaema* from Manus and Rook Islands.¹ While the latter have wings of 239 to 250, the one from St. Aignan and the supposed "Port Moresby" one have wings of 222 and 224, one from Egum 222, the other, however, has the tip of the wings damaged and must measure quite 240. It seems therefore that a smaller subspecies of the colour of *rhodinolaema*, but with shorter wings, is found on the islands off the south-eastern part of Papua, but more information—if resident or not, if on other islands of the Louisiades, Woodlark, D'Entrecasteaux group, etc.—is required before this form should receive a name.

8. *Ptilinopus insolitus* (Schl.).

Ptilopus insolitus Schlegel, *Nederl. Tijdschr. Dierkunde*, i. p. 61, pl. iii. fig. 3. (From a specimen said to have come from New Caledonia, which is of course an error. I accept New Ireland as the typical locality, where the species is not rare, and from where the first specimen, collected during the voyage of the *Gazelle*, became known—cf. *Journ. f. Orn.*, 1876, p. 328.)

6 ♂♀, February and March 1923. "Iris dull white. Bill pale greenish yellow, base dark. Frontal knob red. Feet dark plum red." There is no difference between males and females, except that the latter are very little smaller.

9. *Ptilinopus solomonensis johannis* (Scl.).

Ptilopus johannis Selater, *Proc. Zool. Soc. London*, 1877, p. 556 (Admiralty Is.).

3 ♀, February, March 1923. "Iris pale greenish yellow."

Only known from Admiralty, Rook, and New Hanover Islands. While in *insolitus* the sexes are alike, they differ greatly in this group, as in most species of *Ptilinopus*.

¹ On page 207, vol. xxi. Nov. Zool. I mentioned that this island was named the island of Sir George Rook by Dampier, and that therefore the spelling "Rooke Island" was incorrect. As, however, the name of the famous admiral was spelt Rooke, that should have been the name of the island, even if Dampier spelt his name Rook without an e. As on all English and German maps I have seen the island is called Rook Island, I am not proposing to alter it, though it is wrong, as I do not agree to the alteration of geographical names.

10. *Ptilinopus rivolii rivolii* (Prévost & Knip).

Columba Rivolii Prévost & Knip, *Pigeons*, ii. pl. 57 (1843—No locality. Terra typica: Duke of York Island, see *Nov. Zool.*, 1914, p. 209).

6 ♂, 2 ♀, February, March 1923. "Iris yellowish red. Bill dull greenish yellow, base dark. Feet plum red." Only known from Duke of York, New Ireland, and New Hanover Islands.

11. *Ptilinopus superbus superbus* (Temm.).

Columba Superba Temminck, 1811, "O-taïti" errore! substituted original locality Halmahera!)

6 ♂, 3 ♀, February and March 1923.

Hitherto we have always quoted *P. superbus* binomially, but Lord Rothschild and I fully agree with Stresemann that *P. s. temmincki* from Celebes should be looked upon as a subspecies of *P. superbus*.

12. *Gallicolumba beccarii johannae* (Scl.).

Phlogoenas johannae Sclater, *Proc. Zool. Soc. London*, 1877, p. 112, pl. xvi. (Exact locality doubtful, possibly New Ireland, but probably Duke of York Island. The latter must be looked upon as the typical locality, as this bird so far has not been recorded from New Britain!)

♂ New Hanover, 23.ii.1923. "Iris dark brown. Bill black. Feet bright red." This specimen is more purplish reddish on the back and wings than the type, than our male from Dampier Island (Nov. Zool. 1915, p. 28), and than the specimen collected by Webster on New Hanover 4.iii.1897. As this bird is found on Duke of York and New Hanover, it is bound to occur on New Ireland, but it is obviously not an inhabitant of New Britain, where no collector has found it.

(According to Richmond the name *Gallicolumba* has been genuinely published, and as it has priority over *Phlogoenas* I am afraid we must accept it.)

13. *Chalcophaps stephani stephani* Reichenb.

(First described from New Guinea. The same all over its wide area, except in the Solomon Islands, where a larger subspecies is found.)

4 ♂, 4 ♀, February, March, and April. "Iris dark brown. Bill Chinese red, bright yellowish red. Feet plum red, dark plum red, dark purplish red. Wings ♂ 141-144, ♀ 132-135 mm."

14. *Macropygia amboinensis carteretia* Bp.

3 ♂, 3 ♀, February and March 1923.

First described from New Ireland, and inhabiting also New Britain, Duke of York, and Rook Islands. The head is usually cinnamon-buff on the forehead, changing into darker rufous on the crown, but in one adult male from Rook Island the forehead is lavender-white, turning into bluish grey on the crown. Possibly these are the oldest birds, but probably they do not always attain this coloration. Similar variation occurs in other forms of the species: see Nov. Zool. viii. p. 125, where they are described of *M. amboinensis cinereiceps*—in this case the specimens with rufous and greyish heads were once supposed to be two different species. (Reichenow's description does not seem to fit well: the middle of the throat, for example, not being pure white.)

15. *Macropygia nigrirostris* Salvad.

Macropygia nigrirostris Salvadori, *Ann. Mus. Genova*, 1875, p. 972 (Arak).

♀ 15.ii.1923. "Iris reddish yellow. Bill black. Feet dark plum red."

16. *Reinwardtoena browni* (Scl.)

Macropygia browni Selater, *Proc. Zool. Soc. London*, 1877, p. 110 (Duke of York Island).

2 ♂ ad., 28.ii. and 14.iv.1923. "Iris bright yellow, dark yellow. Bill dark and light horn-brown, base red. Feet plum-red."

Both specimens are in beautifully fresh plumage and have ashy-grey edges and an ash-grey bloom to the slaty-black feathers of the upperside. In our specimens from Duke of York, New Britain, and Rook Is. this is not visible or only indicated, but they are all in more or less worn plumage, so this is evidently due to the condition of the plumage. Wings 228, 236 mm., the same as on other islands. Not recorded from New Hanover.

17. *Nycticorax caledonicus mandibularis* Grant.

[*Ardea caledonica* Gmelin, *Syst. Nat.* i. 2, p. 626 (1789—"Nova Caledonia," ex Latham, "Caledonian Night Heron")].

Nycticorax mandibularis Grant, *Proc. Zool. Soc. London*, 1888, p. 203 (Solomon Is.).

♂ juv., New Hanover, 10.iv.1923. "Iris lemon yellow. Bill black and greenish yellow. Feet black and yellowish green."

The birds from the Bismarck Archipelago were called by Reichenow simply *N. caledonicus*, but Sharpe, *Cat. B. Brit. Mus.* xxvi. p. 161, has correctly united those from New Britain and Duke of York Islands with *mandibularis*; this subspecies has not got the white line from the bill to the back of the eye, has the chest more cinnamon-rufous, but leaving the throat white, and one of our specimens, an adult male collected June 1880 on New Britain by Kleinschmidt (ex Mus. Godeffroy), has the ornamental tape-like nuchal plumes less long than in Australian specimens, and black! This form is also smaller.

The Australian subspecies (which seems to extend its range to the Moluccas, Celebes, and to Timor, at least at certain times) has of course white ornamental head-plumes, has a white line from bill to back of eye, less rufous on the chest, and is a little larger; as it differs at a glance from the New Caledonian birds in its lighter and brighter rufous back, it must be called *N. caledonicus hilli* Mathews, though it was apparently only named so because it came from Australia, and not from New Caledonia. In fact the name was originally given to a (not adult) ♂ from N.W. Australia, because it was supposed to be lighter than other Australian birds. In *B. Austr.* iii. p. 459 this name was used for all Australian birds, which were there described and an adult figured. Besides the lighter back these birds differ from typical *caledonicus* in the pure-white ornamental plumes, which in New Caledonia are black at the tips and have black shafts, and appear to be shorter. This subspecies seems not to be restricted to New Caledonia, but to extend to several Pacific Islands. Strange to say, some old specimens from the Pelew Islands are nearest to those from New Caledonia, but probably differences will be found. One thing must be added: also young *mandibularis* differ from young *N. c. hilli*, as they have the throat less spotted and the jugulum and chest with fewer and narrower dark streaks.

As I have said above, one of our *mandibularis* has one black ornamental plume, in the others these plumes are wanting. In the British Museum is a specimen from Duke of York Island with one long ornamental plume, which is white, but at the base mostly blackish and brown; in another Duke of York bird the ornamental plumes are black at base and at the tip, but whitish in the middle. The difference in the colour of these plumes is therefore clearly not a "specific" one, and we have the Australian subspecies with white plumes, the one from New Caledonia (etc.) and the Bismarck-Solomon Is. with partially white, partially blackish, and the Philippine *manillensis* with entirely black plumes—a nice and succinct group of subspecies. A black tip to the white ornamental plumes occurs exceptionally in adult *N. caledonicus hilli*. This particularly interesting fact seems never to have been mentioned before, yet there is such a specimen in the Tring Museum, and another in the British Museum.

18. *Baza subcristata bismarckii* Sharpe.

Baza bismarckii (Sharpe, Gould's *New Guinea*, pt. xxv., text to plate labelled *Baza gurneyi*. New Britain and New Ireland. Typical locality clearly New Britain).

3 ♂♀ ad., 1 ♀ not quite adult, February and March. "Iris chrome, golden, lemon yellow. Bill black and chalky blue. Feet pale bluish white."

These specimens fully agree with others from New Hanover, New Britain, and New Ireland. This form is nearest to *B. s. gurneyi* from the Solomon Islands, but the bars on the underside in the adults are wider, about as wide as or even wider than the white, and they are not black but slate-grey, and the white areas not so pure white, which gives them a less defined appearance. In younger specimens the cross-bars are blackish, the throat whitish.

19. *Accipiter hiogaster dampieri* (Gurney).

Urospizias dampieri Gurney, *Ibis*, 1882, p. 453 (ex *Ibis*, 1882, pp. 126, 127. New Britain).

♀, 9.ii.1923. "Iris brown. Bill black. Feet yellow." Not adult: upper-side brown with a few blue-grey feathers on forehead, back and rump only, quills brown, but inner primaries growing and blue-grey; tail entirely brown, juvenile.

20. *Haliastur indus girrenera* (Vieill.).

See *Nov. Zool.* xxi. 1914, p. 210 !

♀ ad., 29.iii.1923.

21. *Ninox variegata* (Quoy & Gaim.).

Noctua variegata Quoy & Gaimard, *Voy. Astrol.*, *Zool.* i. p. 166, pl. i. fig. 2 (1833—New Ireland).

2 ♀ ad., March, April 1923. "Iris lemon yellow, golden yellow. Bill pale bluish, tip light horn colour. Feet dull yellow."

New Britain, New Ireland, New Hanover. The supposed occurrence of *N. jacquinoti* on New Ireland is open to doubt. *N. odiosa* seems to be a rather rare species.

22. *Domicella hypoinochroa devittata* (Hart.).

[*Lorius hypoinochrous* Gray, *List. B. Brit. Mus., Psittaci*, p. 49 (1859—"Louisade Islands," Sudest Island !).]

Lorius hypoenochrous devittatus Hartert, *Nov. Zool.* 1898, p. 530 ("low country of S.E. New Guinea, Fergusson, Woodlark, New Britain, New Ireland," type Fergusson Island).

Eight specimens, March and April 1923. "Iris of adults brownish yellow, reddish yellow, dull red, yellow. Bill dark red, bright red, bright yellowish red. Feet black." Five adult specimens have no trace of the black on the underside of the wing, which is characteristic of the typical birds from Sudest Island; in one there is one blackish feather on the underside of the left wing only; two not quite adult specimens have blackish tips to the primary under wing-coverts, forming a bar.

(I am sorry to say we shall have to adopt the generic name *Domicella*, as *Lorius* must be used for the big parrots formerly known as *Eclectus*!).

23. *Geoffroyus heteroclitus* (Hombr. & Jacq.).

Psittacus Geoffroyi heteroclitus Hombron et Jacquinot, *Ann. Sciences Nat.* seconde sér. xvi. p. 319 (1841—"Saint George et Ysabel, Iles Salomon").

4 ♂, 4 ♀, February, March 1923. "Iris white, whitish, dull white."

There is a good deal of variation in the intensity and paleness of the nuchal collar, as well as in the size of the bill, but I cannot limit these variations geographically—they appear to be quite individual.

24. *Trichoglossus haematodus flavicans* Cab. & Rehw.

Trichoglossus flavicans Cabanis & Reichenow, *Journ. f. Orn.* 1876, p. 324 (New Hanover!).

7 ♂♀, March and April 1923. The iris is described on the labels as yellowish red, but once dark red, and once dull greenish yellow! In these specimens we find the same variation as in those from Manus (Admiralty Islands). Cf. *Nov. Zool.* 1914, p. 290. What we said there can only be repeated here. Two of the New Hanover specimens are even brighter yellowish than any from Manus, but some are quite dark green!

[Besides these *flavicans* we received a male and a female shot on New Hanover 3rd and 4th of April 1923, which are very much smaller and indistinguishable from *T. h. maessena*! The occurrence of this subspecies on New Hanover, the home of *T. h. flavicans*, is very peculiar; as it inhabits New Britain and New Ireland, a flock might have strayed out of their home over to New Hanover, or they may have been brought there alive, as these parrots are frequently kept in captivity.]

25. *Charmosynopsis placensis pallidior* R. & H.

Charmosynopsis placensis pallidior Rothschild & Hartert, *Nov. Zool.* 1905, p. 253 (Bougainville, New Britain, New Ireland, New Hanover, type Bougainville).

5 ♂, 3 ♀, February and March 1923. "Iris ♂ reddish yellow, yellowish red, ♀ yellow, yellowish, reddish yellow."

26. *Loriculus tener* ScL.

Loriculus tener Sclater, *Proc. Zool. Soc. London*, 1877, p. 107 (Duke of York Island).

6 ♂ ad., 2 ♀ March 1923. "Iris ♂ ad. white, in ♀ and juv. whitish or pale greenish white. Bill ♂ ad. black," in a (supposed adult) ♀ lower mandible pale

brown, upper black, in a probably juvenile ♀ "dull yellowish and black," edge of the fore-part of the upper mandible being blackish. "Feet dull greenish yellow." Wing ♂ ad. 65.5–67.5 mm. The forehead is very little paler green, but in three specimens there is a yellow tinge, some feathers being dark yellow at base. The inner webs of the remiges are black, or dusky, but not blue, if seen from above, but from underneath the inner webs are quite, the outer partially blue. On the throat is a red patch, more red than orange red, about 10 by 8 to 8 by 8 mm. large. The supposed adult female has only an indication of a yellow spot on the throat and the forehead and cheeks are slightly bluish green, wing (about) 65 mm. The supposed younger ♀ with the pale brown beak (see above) has the forehead bright green like the rest of the upperside and no spot on the throat.

It is strange that after Brown, 1875, nobody found this bird again on Duke of York Island! Over twenty years after it was first rediscovered by Cayley Webster, who shot two specimens on New Hanover, and now we have received this fine series from Albert F. Eichhorn. If it occurs on Duke of York and New Hanover Islands it should also be found in places on New Ireland!

27. *Micropsitta finschii viridifrons* (Rothsch. & Hart.).

Nasiterna viridifrons Rothschild & Hartert, *Orn. Monatsber.* 1899, p. 138 (New Hanover, specimen sent in spirits!).

4 ♂ ad., 1 ♂ semi-ad., 2 ♀ February and April 1923. "Iris yellowish red. Bill black and horn, slaty, dark grey (at base of lower mandible). Feet pale or dull ashy blue."

This fine series is rather a surprise; in the type the middle of the abdomen is orange-red, but in the four adult males it is green, the feathers being light (slightly yellowish) green with darker green tips. (In the type the underside is altogether, with the exception of the orange middle abdomen much more yellowish, evidently due to the action of the spirits.) In one male only, shot 11.iv.1923, are a few orange spots on some feathers of the abdomen. So evidently the type was an unusually bright-coloured example. The sides of the head are blue, the largely blue crown of a different, more violaceous blue. Wings 63–66 mm. The females have the crown of a somewhat duller blue, no blue on the sides of the head, but a dull orange line on the sides of the upper throat. Wings 63 mm.—I consider this form to be a subspecies of *Micropsitta finschii*; the latter has no blue on the crown, but this cannot be looked upon as more than a subspecific character, in view of the small development of the blue patch on the crown in *M. f. nanina*. I thus adopt the following subspecies of *M. finschii*:

M. finschii finschii: San Christoval and Ugi Islands, Solomon group. Large, no blue on crown, but orange red patch on middle of abdomen in adult males. Tail above black and blue. Wing ♂ over 65 mm.

M. finschii aolae: Guadalcanar Island, Solomon group. Smaller, wings 63–65 mm. Blue patch on crown, no orange on abdomen, tail above quite blue, like all following subspecies.

M. finschii nanina: Isabel, Bugotu, Choiseul, and Bougainville Islands, Solomon group. Much like *aolae* but still smaller, wings about 62 mm., blue patch on crown more reduced.

M. finschii viridifrons: New Hanover Island, Bismarck group. Usually a

little larger than *aolae*, blue on crown more extended, sides of head blue, abdomen without or with orange patch.

M. finschii tristrami: Rendova, Gizo, Kulambangra, Vella Lavella, and New Georgia Islands, Solomon group. No blue on crown, no orange patch on abdomen.

The distribution on the Solomon Islands bears out the usual distinction of zoogeographical groups: one form Isabel, Choiseul, and Bougainville, another on the central group (Rendova, Gizo, Kulambangra, New Georgia, Vella Lavella), another on Guadalcanar, and still another San Christoval and Ugi. Of Malaita nothing is known as yet! But curious is the occurrence of a form of the Solomon species on New Hanover, while the rather different Papuan *M. pusio* occurs on New Britain and New Ireland!

28. *Lorius roratus solomonensis* > *goodsoni*!

Eclectus pectoralis solomonensis Rothschild & Hartert, *Nov. Zool.* 1901, p. 82 (Solomon Islands, type from Fauro).

Lorius roratus goodsoni Hartert, *antea*, p. 123 (Manus, Admiralty Islands).

3 ♂, 5 ♀, February and March 1923.

It is very interesting to see that these specimens are intermediate between *L. r. solomonensis* and *L. r. goodsoni* from the Admiralty Islands, described *antea* p. 123. The males do not have the deep grass-green colour of the head and the dark back of *goodsoni*, but agree with the latter in their huge beaks. One female has the enormous bill of *goodsoni*, three have the small bills of *solomonensis*, one is intermediate.

29. *Cacomantis sepulcralis websteri* Hart.

Cacomantis websteri Hartert, in *Through New Guinea* by H. C. Webster, App. p. 370 (1898—New Hanover); *Orn. Monatsber.* 1899, p. 138 (New Hanover); *Ibis*, 1899, p. 278.

Seven adults, all marked ♂. February, March, April, 1923. "Iris dark brown. Bill black. Feet dull yellow and brown."

These specimens agree with the type. The underside of all is dark grey, but two have a patch tinged rufous on the chest, and the throat is indistinctly spotted or striped in these examples, the centres of the feathers being slightly paler, and in one they have a rufous wash. The wings measure 115–121 mm., tails 125–126 mm. The under tail-coverts vary: slate-grey with white bars and some of the shorter ones with cinnamon-rufous tips; slate-grey with pale rufous tips and bars; chiefly cinnamon-rufous with grey bases and a few greyish bars.

The nearest known ally is *C. sepulcralis macrocercus* Stres., *Anz. Orn. Ges. Bayern*, No. 5, p. 37 (Dec. 1921—New Britain), which is paler grey on underside, has the under tail-coverts uniform rust-rufous, has the back more brownish and is larger: wing 116–130, tail 121–138 mm. (See also *Nov. Zool.*, xix. pp. 334–335!)

30. *Alcedo atthis pelagica* Stres.

Alcedo isipida pelagica Stresemann, *Nov. Zool.*, 1913, p. 316 ("Östlichstes Neu-Guinea sowie D'Entrecasteaux- und Louisiade-Archipel"); cf. *Nov. Zool.*, 1914, p. 292.

This ill-defined form seems also to inhabit the islands of the Bismarck Archipelago. Stresemann unites specimens from New Britain and New Ireland with

A. a. hispidoides, which inhabits the Moluccas and the Celebes group, but its re-occurrence on the islands N.E. of New Guinea is hardly credible, nor is this surmise well justified by Stresemann's own measurements; for *hispidoides* he gives 68.5–75, for the smaller *pelagica* (the smaller size being the only difference) 66–72 mm. The New Britain specimens he measured had wings of 69, 71, 71, the New Ireland ones 72, 72, 73 mm., that is to say they are within the limits of *pelagica* with the exception of one which exceeds it by 1 mm. ! The quotation of a measure of 74, given by A. B. Meyer, may be left out of consideration, until it is re-measured. Not many specimens from the Bismarck Archipelago are available; they do not seem to be common, except in certain localities.

31. *Alcyone websteri* Hart.

Alcyone websteri Hartert, Webster's *Through New Guinea*, Appendix, p. 371 (1898—New Hanover); *Ibis*, 1899, p. 278, pl. iii; *Nov. Zool.*, 1914, p. 213 (Rook Island).

2 ♂ ad., April 1923. "Iris dark brown. Bill black, utmost tip whitish. Feet black." The wing has been erroneously said to be "62" in the original description! It is 92, and in the other specimens 91, 90, 89.5, and 87.5, the last being a female. The species is now known to occur also on New Britain and Rook Islands, and should be found in New Ireland.

In *Archiv f. Naturg.* lxxxviii, A, Heft 7, p. 48 (1922) we find the New Britain form mentioned under the name "*Alcyone Websteri magna* Martens," but without any attempt to diagnose it, and I cannot find any former description of this subspecies. Probably G. H. Martens, who died in 1912, believed the New Britain to be larger, because in the original description the wing-measurement was wrong, as explained above. Duncker, who published Martens' list in 1922, probably found the new name in Martens' MS., and adopted it in the belief that it had been published.

32. *Alcyone pusilla richardsi* Tristr. or *aolae* Grant.

Alcyone richardsi Tristram, *Ibis*, 1882, p. 134 (Rendova Island).

♂ ad., New Hanover, 20.iii.1923. "Iris dark brown. Bill black. Feet dull black."

This specimen has the blue breast-band widely interrupted, but on the dividing white area are some bluish and dusky edges to the feathers. Mr. Ogilvie Grant has named two supposed new subspecies "*Alcyone richardsi aolae*" and "*Alcyone richardsi bougainvillei*" (cf. *Ibis*, 1915, *Jubilee Suppl.* pp. 206, 207). Both Mr. Grant's new subspecies have the pectoral band interrupted in the middle, and the under tail-coverts white, tipped with blue; *aolae* is to be larger, *bougainvillei* smaller. I do not think that Mr. Grant's two new subspecies can be recognized from the material at present available. Of *aolae* he had only one specimen; it is true that it has a longer wing, but as some of ours measure up to 57 mm., and its wing is 59, this difference may be accidental. The blue on the breast is united in both specimens from Rendova (the one in the British Museum which Mr. Grant saw, and the one in the Tristram collection now in Liverpool which Dr. Clubb kindly sent me for comparison), but the blue is not quite uninterrupted, there being a number of white spots in the middle, especially in the type-specimen in Liverpool; both from Bougainville and Vella Lavella we have specimens with the blue band across the chest only narrowly interrupted or

widely interrupted, the white space in the middle either uniform or with purplish blue edges to the feathers, a character claimed by Grant for his "*bougainvillei*." The under tail-coverts in the type of *richardsi* are half white and half blue, and we have one from Kulambangra which is quite similar in this respect, while the others have smaller blue tips. As therefore all supposed differences are doubtful, the separation of three forms from the Solomon Islands is at least premature and doubtful. The distribution too would be against all rules: 1 Rendova, another Gizo, Kulambangra, Vella Lavella, Bougainville, Choiseul—and I may now add New Ireland and New Hanover, and a third one on Guadalcanar. The only objection to uniting all these three forms would be that the two known Rendova specimens are alike and have a wide blue breast-band, while this is absent or rare in all others, but I believe this to be accidental, and we must await a series from Rendova.

I may add that the specimens from New Ireland (one !), New Hanover (one !), and Solomon Islands (18 examined) are less purplish and have larger bills than *A. p. pusilla*, which also has no blue tips to the under tail-coverts.

33. *Halcyon tristrami nusae* Heinr.

Halcyon nusae Heinroth, *Journ. f. Orn.* 1902, p. 437, pl. viii. fig. 2. (Islands of Nusa near northern Cape of New Ireland, Nuungan near Kapoteron between New Ireland and New Hanover, and Kung or Nakung near north coast of New Hanover.)

Eight specimens, males and females, February to April 1923. "Iris dark brown, bill black, basal two-thirds of lower white, feet dull blackish slate." Wings, 105–110 mm. These birds are evidently nearer to *H. tristrami* from New Britain and New Ireland, but differ as follows: the crown is darker, not dark blue, but greenish black, the feathers being black with narrow greenish fringes, or sometimes with a bluish wash, and behind the eyes is a longitudinal dark greenish patch; on the occiput are some irregular white feathers. Upper back, scapulars, and upper wing-coverts are darker, less blue, more blackish or dusky greenish. Rump and upper tail-coverts are generally more greenish. The underside is white, even in freshly moulted specimens, but in some specimens there is a rusty buff wash on the sides and under wing-coverts, but not so strong as in *tristrami*.—No doubt this is a subspecies of the latter, but *tristrami* may eventually be looked upon as a subspecies of *chloris*. The figure in the *Journ. f. Orn.* is not good, the rump being too light and too bright, the green above the eye too extended.

34. *Merops ornatus* Lath.

Merops ornatus Latham, *Index Orn.*, Suppl. p. xxxv. (1801—"Habitat in Nova Hollandia." Mathews quotes "New South Wales").

2 ♂, 2 ♀, 10 .iv. 1923.

Merops ornatus is a winter visitor from Australia. The breeding Bee-eater of New Britain is *Merops philippinus salvadorii*.

35. *Eurystomus orientalis neohanoveranus* Hart.

Eurystomus neohanoveranus (sic !) Hartert, *Nov. Zool.*, 1901, p. 185 (New Hanover ! The ugly hybrid name was thoughtlessly adopted, having been given to a butterfly, and so become familiar).

2 ♂, 1 ♀, March and April 1923. All three in moult. "Iris dark brown. Bill in two red with black tip, in one of the males entirely red ! feet burnt red."

This form differs from *E. o. crassirostris* (New Guinea and New Britain) in the more purplish crown, more bluish back; the light shaft-lines on the throat are less conspicuous, and the black tip on the bill is more restricted and (in one) even absent; the differences from *E. o. solomonensis* are stated in the original description.

36. *Rhyticeros plicatus ruficollis* (Vieill.).

Buceros ruficollis Vieillot, *Nouv. Dict. d'Hist. Nat.* iv. p. 600 (Waigiu)

A very adult ♂ March 2nd, 1923.

37. *Hemiprocne mystacea aëroplanes* Stres.

Hemiprocne mystacea aëroplanes Stresemann, *Anzeiger Orn. Ges. Bayern*, No. 5 (1921—Blanche Bay, New Britain).

4 ♂, 4 ♀, March 1923.

These specimens bear out Dr. Stresemann's diagnosis: they have shorter wings than *H. m. mystacea*, and the back is paler, while I cannot find that the breast is constantly paler. The wings measure ♂ 218–223, ♀ 218–225 mm. According to Stresemann found on New Britain and New Ireland, and his surmise that the Manus ♀ belongs to *aëroplanes* is also correct.

38. *Collocalia fuciphaga vanicorensis* (Quoy & Gaim.).

Hirundo vanicorensis Quoy et Gaimard, *Voy. Astrolabe*, *Zool.* p. 206, pl. xii. fig. 3 (1830—Vanikoro, one of the Santa Cruz Islands, east of San Cristoval, southern Solomon Islands).

I believe it is correct to unite the specimens from Vanikoro to the islands of the Bismarck Archipelago. The tarsi are entirely bare of feathers in New Hanover and New Britain. Cf. Stresemann, *Verh. Orn. Ges. Bayern*, xii. 1914. Of Stresemann's *C. f. pseudovestita* (*Archiv f. Naturg.* lxxxix. 7 and 8, p. 27 (1923—Astrolabe Bay, Sattelberg, and Goodenough Islands), 6 out of 7 had the tarsus feathered.

8 ♂♀, second half of March 1923. No moult. Wings “♂” 119, 120, 122, 123·7, “♀” 117, 118, 119, 120, 123 mm. The variation in the length of the wings should caution one to name forms of these *Salanganes* on average length only!

39. *Collocalia esculenta*.

3 ♂, 1 ♀, February and March 1923.

2 ♂ and 1 ♀ are typical *esculenta*, without any white on the rump, wings ♂ 96, 96, ♀ 98 mm. The third male has a wing of 96, the rump strongly mixed with white, each feather having a white subterminal cross-bar! This specimen is therefore quite different from the other forms of *C. esculenta* described, i.e. *C. e. stresemanni* (1914!) from Manus with some rump feathers chiefly white and others edged with white, *C. e. heinrothi* (1919) from Nusa with nearly all the upper tail-coverts and the adjacent rump feathers white throughout, and *C. e. tametamela* (1921) from New Britain, like *stresemanni*, but the middle of the rump without white. The wings are rather short, but equally short-winged specimens occur elsewhere (especially on the Louisiades, but also west of New Guinea). What are all the others? Are they really three different subspecies, or they do belong to one variable form from the islands N.E. of New Guinea? Against that seems to speak the fact that only one out of three from New Hanover

shows white on the rump. With regard to the type of *heinrothi*, it must be said that it is obviously a form of *esculenta*, and not of *uropygialis*, unless the latter is also taken into the chain of subspecies called *esculenta*; this is in fact proposed by Stresemann, but his conclusion is open to doubt. Without series from all the above-mentioned localities we shall not understand these forms.

40. *Caprimulgus macrurus albolaxatus* R. & H.

Caprimulgus macrurus albolaxatus Rothschild & Hartert, *Nov. Zool.*, xxv. p. 323 (1918—Vulcan Island).

♀ ad., 12.iv.1923. Cf. Stresemann, *Archiv für Naturg.* lxxxix. 7, pp. 30, 31 (1923—New Britain, Dampier, and Vulcan Islands, and north coast of New Guinea from the Mamberano River to Astrolabe Bay !). It is difficult to say from one ♀ to which subspecies it belongs, but if the distribution accepted by Stresemann is correct, as it seems to be, the bird belongs to *albolaxatus*.

41. *Pitta macklotii novae-hibernicae* Rams.

Pitta novae-hibernicae (sic !) Ramsay, *Proc. Linn. Soc. New South Wales*, iii. p. 73 (1878—New Ireland).

12 ♂♀ ad., February and March 1923. "Iris dark brown. Bill horn-black. Feet slaty blue."

As there are no New Ireland specimens in Tring and London I sent one of these from New Hanover to Dr. Stresemann, who also lent me one of theirs from New Ireland. They are absolutely the same in colour and size.

In fresh plumage the back is more greenish, in a worn state a little more bluish. Cf. *Nov. Zool.* 1914, p. 214.

42. *Monarcha verticalis* Scl.

Monarcha verticalis Selater, *Proc. Zool. Soc. London*, 1877, p. 99, pl. xiv. fig. 1 (Duke of York Island).

6 ♂, 1 ♀, March and April 1923. "Iris dark brown. Bill and feet slaty blue." Wings ♂ 87–92, ♀ 83 mm. New for New Hanover.

43. *Monarcha chrysomela chrysomela* (Less.).

Muscicapa chrysomela Lesson, *Voy. Coquille, Zool.* i. 1. p. 344 (1828—Name for fig. 2, pl. xviii, shot by Lesson at Port Praslin, South New Ireland ! In part 2, p. 594, 1829, Garnot says it came from New Zealand !)

5 ♂, 3 ♀, February and March 1923. "Both sexes iris dark brown. Bill slaty blue with black tips. Feet slaty blue." The white spot under the eye in these fine skins obvious in both sexes, but in bad skins sometimes not seen. See description of ♀ *Journ. f. Orn.* 1902, p. 453. Wings ♂ 70–74, ♀ 72–73 mm. Moults in a February male.

44. *Rhipidura rufiventris albertorum* subsp. nov.

8 ♂♀, February and March 1923.

Rhipidura rufiventris abdomine albo, pectore cinereo immaculato, pileo schistacei-cinereo, tergo cinereo, rectricibus externis alboterminatis.

In the white (not buff) abdomen resembling *Rh. rufiventris niveiventris* from the Admiralty Islands, but the crown not black, but slaty-grey, back much paler

grey, breast-band grey, not slaty. Wings ♂ 88–90.5, ♀ 80–85 mm. “Iris dark brown. Bill and feet black.” Some specimens moulting.

Type: ♂ New Hanover, 23.ii.1923. No. 8212 of the Meek collections. This is a very interesting addition to the list of the birds of New Hanover, as it is a connecting link between *Rhip. rufiventris setosa* from New Britain, Duke of York Island, and New Ireland (with which it agrees very much in the colour of the upperside) and *Rhip. ruf. niveiventris* from the Admiralty Islands which has the same white abdomen. Named in honour of Albert F. Eichhorn, the able collector, and Albert S. Meek, the organiser of the expedition.

(Talking of the subspecies of *Rhipid. rufiventris*, I must mention a silly mistake I made in describing twice the same subspecies, *Rh. ruf. perneglecta*, *Bull. B.O. Club*, xxxviii. p. 59 (1918—Tiandu group) and again under the name *Rh. ruf. tiandu*, *Nov. Zool.* xxvii. p. 497 (1920—Tiandu group)! I also omitted from the type list in *Nov. Zool.* xxvii. not only *Rh. r. perneglecta* but also *Rh. r. finitima*, *Rh. rufifrons granti*, and *Rh. rufifrons commoda*, *Bull. B.O. Club*, xxxviii. pp. 59, 60 (1918).

45. *Monarcha cinerascens* subsp.

♀ jun., 28.iii.1923. This specimen appears to be paler than *inornata* Garnot, 1829, described from a specimen from Dorey, New Guinea.

46. *Monarcha alecto chalybeocephalus* (Garnot).

[*Drymophila alecto* Temminck, Pl. Col. 430 (1827—Typical locality designated Ternate !).]

Muscicapa chalybeocephalus Garnot (not Garnier !), *Voy. Coquille*, i. 2, p. 589 (1829—New Ireland, Lesson's specimen from Port Praslin).

(For dates of the *Voyage of the Coquille* see Mathews, *Austral Avian Record*, ii. p. 49. If these dates are accepted, the name *chalybeocephalus* is undoubtedly more recent than Temminck's name *alecto*, and this bird must therefore be called as above !)

3 ♂ ad., 3 ♀ ad., February and March. Wings ♂ 89–90, ♀ 85–88 mm.

47. *Monarcha* ?

We have also 2 males, shot 1. and 3.iii.1923, which are purplish, the feathers of the chest almost black, narrower, more velvety, abdomen brownish black. Wings 84, 85 mm. What are they? They cannot be immature, as these birds moult from the juvenile plumage (back rufous, underside white) direct into the metallic glossy plumage of the adults. I believe these to belong to an undescribed species, hitherto overlooked on account of its similarity to *M. alecto chalybeocephalus*. Probably the ♀ will differ from those of *M. a. chalybeocephalus*, and if so we do not seem to have received specimens of it. There is no reason why my surmise should not be correct, if we remember that in Europe we have in the same places such similar species as *Acrocephalus scirpaceus* and *palustris*, *Certhia familiaris* and *brachydactyla*, *Parus palustris* and *atricapillus*, *Galerida cristata* and *theklae*. It must be left to an ornithologist to pay special attention to these *Monarchae* in the field, and to clear up their status.

48. *Lalage karu albidior* subsp. nov.

Lalage subspecies *L. karu karu* dictae similis sed subtus albidior, plaga abdominali rufescente minore. Subspecies *L. karu pallescens* dictae similis sed subcaudalibus multo saturatioribus differt.

4 ♂, 4 ♀, February and March 1923. “Iris dark brown. Bill and feet black.”

The nearest ally is *L. karu karu*, which inhabits New Britain, New Ireland, Rook, and Duke of York Islands. The underside, however, is pure white (without a buff tinge) and the rufescent patch on the abdomen is much smaller. This is obvious in both sexes. The bill is also not quite so wide as in *L. k. karu*. From *L. k. pallescens* it differs in the darker rufescent under tail-coverts and abdominal patch. Wing males 97–99, females 95–97 mm.

Type: ♂ ad., 21.ii.1923. A. F. Eichhorn coll. No. 8203 of the A. S. Meek collections.

Hüsker collected a ♂ of this species on New Hanover, but apparently it has not been carefully compared, nor could one separate such closely allied form from a single specimen. For other subspecies see *Bull. B.O. Club*, xxxvii. pp. 15–17.

49. *Graucalus papuensis sclateri* Salvad.

Graucalus sclateri Salvadori, *Ann. Mus. Civ. Genova*, 1878, p. 325 (New Ireland).

5 ♂, 4 ♀, February, March, and April 1923. "Iris dark brown, bill and feet black."

Known from New Britain, Duke of York Island, New Ireland, and Rook Island. Cf. *Nov. Zool.* xxi. p. 215.

50. *Edolisoma morio remotum* Sharpe.

Edolisoma remotum Sharpe, *Mitt. Zool. Mus. Dresden*, i. p. 369 (1878—New Hanover!).

4 ♂ ad., 5 ♀ ad., 1 ♂ juv., February and March 1923. "Iris brown, bill and feet black."

I think there is no doubt that this is a subspecies of *E. morio*, which has many subspecies! Recently Stresemann described *E. morio heinrothi* from New Britain, with a barred underside! Of the females of *remotum* four have the underside unspotted, one has a number of small black spots on the abdomen. The young male moults from a plumage similar to that of the female, but paler, into that of the adult male; it was shot 19.ii.1923. Wing ♂ 126, 127 (moulting wings in February), ♀ 122, 123 mm. (moulting in February).

51. *Pachycephala pectoralis finschi* Rehw.

Pachycephala finschi Reichenow, *Orn. Monatsber.* 1899, p. 8 (Ralum in New Britain!).

6 ♂, 2 ♀, February and April 1923. "Iris dark brown. Bill black. Feet dull, vandyke, slaty, or greyish brown."

♂ wing 87–95 (!), ♀ 85–89 mm.

Lord Rothschild and I have written about *Pachycephala finschi* and *dahli* in *Nov. Zool.* 1903, pp. 101, 102, and 1914, p. 216. *P. finschi* differs from *dahli* (Reichenow, 1897!) in having the outer edges of the quills olive-green, while in *dahli* they are ashy-grey, on the innermost secondaries greyish green; the upperside is also slightly deeper olive-green in *finschi*. I am not sure if the female of *dahli* is known; what Reichenow says is apparently not correct, as our females of *finschi* do not have pure-white throats and show faint cross-bars.

The type of *finschi* was obtained on the Gazelle Peninsula in New Britain, where this form appears to be common, but from the same place there are specimens in the British Museum which are all *dahli*! According to Heinroth both

dahli and *finschi* occur on Nusa, just north of New Ireland! We have received *finschi* from Rook Island and New Hanover, but *dahli* I have only seen from Pipon and Palakura in the Duke of York group (Liverpool Museum), from the Credner Islands, and one, collected by Wahnes and Ribbe, from Munia in the Shortland group, Solomon Islands, 21.viii.1893—the last quite an unexpected locality! The two forms are so much alike, and belong so obviously to the *pectoralis* chain of subspecies, that I prefer to treat them both as subspecies of the latter. There is of course the possibility that one of them, *dahli*, has evolved and has been found in separate areas, perhaps, like *Carpophaga van-wycki*, on outlying islets, but for some reason has recently broken its bounds, and is spreading and invading the strongholds of *finschi*.

In view of the distribution of these two forms one might suggest that they were only varieties of one and the same form, but the fact that *dahli* has a lighter shade of colour on the upperside speaks against the theory, as we cannot suppose that the variation in the colour of the edges to the remiges is connected with a paler upperside. More investigations are required to elucidate these forms.

52. *Myzomela cruentata coccinea* Rams.

Myzomela coccinea Ramsay, *Proc. Linn. Soc. N.S. Wales*, ii. p. 106 (1878—Duke of York Island.

One specimen, said to be a female, full plumage of adult).

Myzomela erythina (sic!) Ramsay, *l.c.* p. 107 (1878—New Ireland. Description of a young bird, one specimen).

Myzomela kleinschmidti Sharpe, Gould's *B. New Guinea*, iii. (part 17) (1884—New Britain. Type compared).

5 ♂ ad., 1 ♀ juv., 2 ♀ juv., February and March 1923. "Iris dark brown. Bill black. Feet slate-colour, slaty blue." The five adults are all marked ♂. They are scarlet, throat a little darker, crown much darker. Their wings measure 60 to 63 mm. The young birds have the upperside brownish red, head darkest, sides of head pink, rest of underside pale dull brown with a faint pink tinge, the one marked ♂ has a wing of 58, the two females wings of 53 mm. I therefore believe that they are correctly sexed. I believe that the adult ♀ is like the adult ♂, but much smaller. This is perhaps the case with other forms of *Myzomela*, such as *wakoloensis*, and it is therefore that Stresemann and others only collected males: the females not being distinguishable at a distance from the males, they would not be spotted, and young birds were not there when they collected—this is at least an explanation, and further research must show if it is correct.

I am convinced that *M. c. coccinea* and *erythina* are the adult and young, and I do not see that *kleinschmidti* differs. The name *coccinea* appeared on page 106, *erythina* on page 107, and it is an enigma why Sharpe believed (cf. *B. New Guinea*, l.c.) that page 107 had appeared a year before page 106! I cannot see tangible differences between our adults from New Hanover, 1 adult (type of *kleinschmidti*) from New Britain, and 1 adult from New Ireland, nor between two young birds from New Hanover and New Britain, the latter collected by Th. Kleinschmidt. The types of *M. coccinea* and *erythina* are in Australia. *M. cruentata cruentata* from the mountains of New Guinea is a much lighter and smaller bird.

53. *Myzomela nigrita ramsayi* Finsch.

Myzomela ramsayi Finsch, *Zeitschr. ges. Orn.* iii. p. 21 (1886—Is. Kapaterong and Nusa near N. New Ireland).

1 ♂ ad., 16.iv.1923. "Iris dark brown. Bill and feet black."

Better series are desirable of the various black *Myzomelae*. We must, however, distinguish between the three insular forms:

M. nigrita pammelaena Scl., Admiralty Islands. Only one adult known, which has a wing of 75 mm.

M. nigrita ramsayi Finsch, small islands of Kapaterong and Nusa, and New Hanover (probably also New Ireland). 1 ♂ New Hanover and 1 ♂ Nusa have wings of 72 mm. (The measurement of 64 given by Finsch for his type is doubtless that of a female, and probably too small.)

M. nigrita tristrami Rams., San Christoval and Ugi. Very little, if constantly, smaller still: wings 67–70 mm. Plumage not glossy, while there is a distinct steely gloss in *M. n. tristrami*. There is no difference in the colour of the inner edges of the remiges!

In all these forms the ♀ is like the ♂, only smaller. The young of *tristrami* is partially dark grey, and the basal part of the bill is yellow. Another specimen in quite black plumage has the greater part of the bill still yellow, but this is doubtless a juvenile character.

54. *Zosterops fuscicapilla hypoxantha* Salvad.

Zosterops hypoxantha Salvadori, *Atti R. Ac. Sci. Torino*, xvi. p. 623 (1881—New Britain).

8 ♂♀, February and April 1923. "Iris marked brown six times, reddish brown once, grey once. Bill black, slaty blue or slate-colour at base. Feet slaty blue."

This white-eye occurs on New Britain, New Ireland (Curtis coll.), and New Hanover. No doubt *F. fuscicapilla*, *admiralitatis*, and *hypoxantha* form one species. The wings of our *hypoxantha* measure 57–59, once 61 mm.

55. *Dicaeum eximium eximium* Scl.

Dicaeum eximium Sclater, *Proc. Zool. Soc. London*, 1877, p. 102, pl. xiv. (New Ireland).

5 ♂ ad., 2 ♀ ad., 1 ♀ juv., February, March, April 1923. "Iris ♂♀ ad., dark brown, bill and feet black. ♀ juv.: Iris brown. Bill brown and yellowish. Feet slaty blue." Wings ♂ ad., 50–52.5 mm.

The young female resembles the adult ones, but the upperside is duller and greyer, throat and chest greyish.

Dicaeum layardorum is quite different, there is only a red patch on the jugulum, while in *eximium* we find a more or less wide band, but sometimes it is more like a large spot. The upperside in *layardorum* is deep brownish grey, while in *eximium* it has an olivaceous tinge. The crown in *layardorum* is hardly darker than the back, and has only on the forehead a rufous-brown tinge, while in *eximium* it has a dark red tinge all over.

The females are very much alike, but that of *eximium* is more olivaceous on the back, and the flanks are more olive. Nevertheless I consider *layardorum* only to be a subspecies of *eximium*. The former inhabits New Britain, the latter New Ireland and New Hanover.

56. *Cinnyris jugularis flavigastra* (Gould).

Nectarinia flavigastra Gould, *Proc. Zool. Soc. London*, 1843, p. 104 (New Ireland!).

Cinnyris frenata flava Heinroth, *Journ. f. Orn.*, 1903, p. 85 (New Britain).

4 ♂ ad., 1 ♂ fere ad., 3 ♀, February and April 1923.

Dr. Heinroth quite correctly separated the form from the islands of the Bismarck Archipelago (New Britain), but we cannot use his name, as Gould had long ago named this form *flavigastra*. Cf. *Nov. Zool.*, 1914, pp. 297, 298.

57. *Cinnyris sericeus corinna* (Salvad.).

Hermotimia corinna Salvadori, *Atti R. Ac. Sci. Torino*, xiii. p. 532 (1878—Duke of York Island).

4 ♂ ad., 2 ♂ juv., 2 ♀, February and March 1923.

The throat of the adult male is described by Salvadori and Reichenow as steel blue, and that agrees with our New Hanover specimens. From Rook Island we have one male exactly like the latter, while two others have a distinct purplish tinge on the throat, and there is also some purple on the throats of a specimen from Duke of York Island (Th. Kleinschmidt coll.), and on some New Ireland ones.

58. *Cisticola exilis* (subsp. ?).

♂ ad. breeding plumage (uniform crown), 5.iii.1923. "Iris greyish brown."

♂ ad. off plumage (striped crown, longer tail), 8.iii.1923. "Iris grey."

6 ♂♀ juv. (underside yellow!), 5.iii. to 13.iv.1923.

I have not been able to apply a subspecific name to the New Hanover specimens. They are uncommonly like *C. exilis exilis* from New South Wales, Victoria, etc., but there are several subspecies of *C. exilis*, even in Australia! Mathews has gone in for their study, but spoilt his work and made it difficult to understand by distinguishing not less than 10 subspecies in Australia, some very superficially described; nevertheless there are several subspecies, the most distinct being the very light-coloured *C. e. normani* Math. from "coastal Northern Territory and Queensland." Another recognizable form seems to me to be *C. e. rustica* Wall., a very rich rufous bird, described from Buru and occurring also on other Moluccan Islands and the Celebes group.

59. *Aplonis metallica nitida* (Gray).

Calornis nitida Gray, *Proc. Zool. Soc. London*, 1858, p. 181 (New Ireland).

8 ♂♀ ad., February to April 1923. "Iris crimson, once brick red."

The purplish patch on the interscapular region varies much in extent, and is sometimes merely indicated, but it has never a blue-green centre. Wings ♂ 109–114, ♀ 104–108 mm.

60. *Mino dumontii kreffti* (Scl.).

Gracula kreffti Sclater, *Proc. Zool. Soc. London*, 1869, pp. 120, 124, 126, pl. ix. (Solomon Islands).

8 ♂♀ ad., February and March 1923. "Iris golden yellow. Bill deep or reddish yellow. Feet chrome or cadmium yellow." Wing ♂ 166–175, ♀ 163–166 mm. The specimens shot on Rook Island, where this bird is not rare, have very large bare patches round the eyes, but the size of these patches varies.

61. *Corvus coronoides insularis* Heinroth.

Corvus insularis Heinroth, *Journ. f. Orn.* 1903, p. 69 (New Britain).

3 ♂ ad., 7. and 17.iii.1923. "Iris pale bluish. Bill and feet black." Wings 309, 312, 320 mm. Cf. *Nov. Zool.* 1914, p. 218.

62. *Munia nigerrima* Rothsch. & Hart.

Munia nigerrima Rothschild & Hartert, *Orn. Monatsber.* 1899, p. 139 (New Hanover).

6 ♂, 2 ♀, all adult, February, March, April 1923. "Iris dark brown. Bill black, base slaty. Feet dark slaty blue."

The description was made, as stated, from an adult male and a young bird, both from spirits! The fresh series agrees with the diagnosis, but the black is purer, not brownish, and slightly glossy. The hidden bases of the feathers on the abdomen are slaty grey, only a few specimens show isabelline bases like the type, and these must be remains of the juvenile plumage, described *l.c.* Wings ♂ 46-50, ♀ 47-48 mm. Body moult in February and March.

ÜBER *HIERAAËTUS AYRESII* UND *SPIZAËTUS AFRICANUS*

VON E. STRESEMANN.

SEIT der I. Band von Reichenows Vögeln Afrikas^{*} erschien (1901), ist die Kenntnis afrikanischer Adler durch 4 Veröffentlichungen kräftig gefördert worden. 1904 legte v. Erlanger dar, dass in Abessinien zwei *Hieraaëtus*-Arten neben einander leben, die sich sehr ähnlich sehen: eine grosse und eine kleine.¹ 1906 berichtigte O. Neumann die durch v. Erlanger gewählte Nomenklatur und zeigte, dass die grosse der echte *H. spilogaster* sei, die kleine dagegen als *H. lucani* geführt werden müsse. Er gab die Kennzeichen der alten Vögel bekannt und skizzierte die Verbreitung beider Arten, deren Vorkommen für einen grossen Teil Afrikas nachgewiesen sei.² 1919 wies Finch-Davies nach, dass auch in Südafrika beide Spezies vorkommen, und dass der älteste Name für die kleinere unter ihnen *H. ayresii* (Gurney) sei, wozu *H. lucani* (Sharpe & Bouvier) als Synonym gestellt werden müsse.³ Im gleichen Jahr gelang es W. L. Selater, den letzten Rest der früher in der Literatur herrschenden Konfusion zu bescitigen; er stellte nämlich fest, dass in Westafrika neben *H. ayresii* ein von Reichenow, Sharpe und Neumann damit verwechselter Adler lebe, der zu einer ganz anderen Gattung gehört und *Spizaëtus africanus* (Cassin) genannt werden muss.⁴

Kein Museum der Erde, selbst das Britische Museum nicht, vereinigt wohl zur Zeit so viele lehrreiche Exemplare der drei Arten wie das Berliner. Ich gebe zunächst eine Übersicht über das hiesige Material unter Beifügung einiger Masse.

Die Unterschiede zwischen *Hieraaëtus spilogaster* und *H. ayresii* sind von dem ausgezeichneten Raubvogelkenner Finch-Davies, der der Wissenschaft leider schon durch den Tod entrissen ist, zum Teil klargestellt worden. Da er aber manche wichtigen Charaktere überschen hat, sei hier erneut eine Übersicht über die auffälligsten Kennzeichen gegeben.

Beide Vögel sind grundverschieden. Das äussert sich im ganzen Bau. *H. ayresii* ist nicht nur kleiner, sondern auch graziler, "edler." Er hat einen relativ viel kürzeren Schwanz (Index 50.0–53.7 gegen 56.7–61.2). Sein Fuss ist schlanker, feingliedriger, seine Mittelzehe gegenüber der Hinterzehe relativ etwas länger als bei dem mächtigen *H. spilogaster*, was aber nur die relativen Masse zum Ausdruck bringen. Sein Schnabel ist seitlich etwas stärker komprimiert. Ferner ist *H. ayresii* in allen Kleidern mit deutlicher Nackenhaube versehen, deren Federn selbst im Jugendkleid 53 mm an Länge erreichen können; dem *H. spilogaster* fehlt eine so ausgeprägte Haube, wiewohl auch bei ihm die Federn dieser Region verlängert sind.

Neben den genannten strukturellen Unterschieden (deren Zahl sich bei Kenntnis der Skelette zweifellos bedeutend vermehren liesse) laufen viele Färbungs differenzen einher. In allen Kleidern sind die Schäfte der Schwungfedern und Steuerfedern, von oben gesehen, bei *H. ayresii* schwarz oder dunkel

¹ J. f. O. 52, 1904, pp. 184–187.

² *Ibis*, 1919, pp. 167–179.

³ Bull. B.O. Club, xvi, 1906, p. 112.

⁴ Bull. B.O. Club, xxxix, 1919, pp. 87–89, 93–94.

	Fundort.	Sammler.	Datum.	Flügel.	Schwanz.	Fl.-Schw.-Index	Sex.	Kleid.
<i>Spizaetus africanus</i> (Cassin)								
1	Lolodorf (Kamerun)	Jacob	—	320 + x	215	67.2	—	Ju. K.
2	Lolodorf (Kamerun)	Jacob	—	325	230	70.7	—	Ju. K.
3	Victoria (Kamerun)	Strunk	—	348	220	63.2	—	Ju. K.
4	Kamerun	G. Zenker	—	326	215	65.9	—	ad.
5	Bascho (Nord-Kamerun)	v. Oertzen	24.i.05	329	220	66.8	♀	ad.
6	Togo	Richers	—	351	240	68.4	—	Ju. M.
7	Kame (Togo)	Baumann	24.ii.93	295 + x	210	71.2	♂	ad.
<i>Hieraaëtus fasciatus spilogaster</i> (Bonaparte)								
8	Dire Danoa (N. Abessinien)	E. Wache	ii.09	436	247	56.7	[♀]	ad.
9	Berbera (Somaliland)	Gindi	—	400	235	58.7	—	ad.
10	Hannington-See (Br. O. Afrika)	A. Berger	30.x.08	431	264	61.2	—	ad.
11	Britisch O. Afrika ?	A. Berger	08	428	240	57.7	—	ad.
12	Amami (D. O. Afrika)	Vosseler	—	424	250	58.9	—	Ju. K.
13	Amami (D. O. Afrika)	Vosseler	—	418	250	59.8	—	I. Ja. K.
14	Uhehe (D. O. Afrika)	v. d. Marwitz	—	402	237	58.9	—	Ju. K.
15	Usafua (D. O. Afrika)	Goetze	6.vii.99	433	250	57.7	—	ad.
16	Sanyi (D. O. Afrika)	Münzner	16.ix.13	411	250	60.8	—	Ju. M.
17	Windhuk (S.W. Afrika)	Lübbert	—	398	242	60.8	—	Ju. K.
18	Kanya (Br. Betschuana-land)	Fritsch	viii.65	415	252	58.3	—	Ju. K.
<i>Hieraaëtus ayresii</i> (Gurney)								
19	Bangwa (Kamerun)	Conrad	—	388	205	52.8	♀	Ju. K.
20	Bebai (span. Guinea)	G. Tessmann	7.x.08	326	175	53.7	♂	Ju. K.
21	Misahöhe (Togo)	Baumann	1.iv.95	339	175	51.6	♂	ad.
22	Sigifluss (D. O. Afrika)	O. Neumann	ii.93	400	205	51.3	[♀]	Ju. K.
23	Mocambique	Peters	—	378	200	52.9	—	ad.
24	Zondag Rivier (Kapland)	Mundt & le Maire	—	420	210	50.0	[♀]	Ju. K.

haarbraun, bei *H. spilogaster* dagegen weiss oder gelblich weiss, seltener hellbraun. In allen Kleidern ist ferner die Aussenfahne der 3.–6. Handschwinge bei *H. ayresii* schwarz (zuweilen leicht grau getönt), bei *H. spilogaster* aschgrau bis silbergrau. Im Jugendkleid ist *H. ayresii* auf der Unterseite blasser, nicht so stark rostfarben überflogen wie sein Doppelgänger; die Federn der Körperseiten, die Axillaren und die Unterflügeldecken tragen lanzettförmige Flecke von dunkelbrauner Farbe, die manchmal nur schmal, in anderen Fällen recht breit sind. Dem *H. spilogaster* fehlen diese Flecke im Jugendkleid; die entsprechenden Federn sind nur mit dunkelbraunem Schaftstrich versehen. Die Stirn und ein Brauenstreif sind beim jungen *H. ayresii* rahmfarben, beim jungen *H. spilogaster* wie der übrige Oberkopf schwarzbraun. Die hellen Schwanzbinden dieses Kleides sind bei *H. ayresii* viel grauer, bei *H. spilogaster* viel bräunlicher. Aus dem Jugendkleid mausert *H. spilogaster* in ein 1. Jahreskleid, das durch die rostfarbige Endigung der im übrigen weissen, längs der Mitte schwarz gezeichneten Brust- und Bauchfedern und das Vorherrschen der Rostfarbe an Axillaren und Unterflügeldecken gegenüber dem adultus deutlich gekennzeichnet ist. Ob auch *H. ayresii* ein solches Zwischenkleid anlegt, ist mir unbekannt. Im Alterskleid erkennt man, wie zuerst O. Neumann ermittelte, die beiden Arten leicht an der Färbung der Unterflügeldecken, die bei *H. ayresii* schwarz mit breitem weissen Saum sind, während bei *H. spilogaster* das Schwarz vieler Federn bis an den Saum reicht und so ein grosses zusammenhängendes schwarzes Feld zustande kommt. Die dunklen Schwanzbinden sind bei *H. ayresii* (bis auf die distale) breiter und von regelmässigerer, nicht

so unruhig im Zickzack verlaufender Begrenzung, die distale Binde dagegen ist bei *H. ayresii* viel schmaler. Während diese Binde bei *H. spilogaster* die ganze Schwanzspitze einnimmt und 50–60 mm breit ist, ist sie bei *H. ayresii* nur 20–26 mm breit und erreicht hier nicht die Federspitze, sondern wird noch (wenigstens am mittleren Paar) von einer grauen, weiss gesäumten gefolgt.

Die Verbreitung beider Arten lässt sich bisher nur in groben Zügen angeben. Man kennt:

H. ayresii von: Abessinien und den Gallaländern (v. Erlanger), Uganda und Britisch Ost-Afrika (van Someren, Brit. Museum), Deutsch Ost-Afrika (Neumann), Mozambique (Peters), Osthälfte Südafrikas südlich bis zur Gegend von Port Elizabeth (Mundt & le Maire); ferner Westafrika: Portugiesisch Kongo, Spanisch Guinea, Kamerun, Togo.

H. spilogaster von: Abessinien und Somaliland sowie Britisch und Deutsch Ostafrika. Wie weit die Art in der Osthälfte Afrikas nach Süden geht, ist noch unbekannt. Aus der Westhälfte Afrikas kenne ich nur zwei sichere Fundgebiete: Windhuk (Lübbert) und Angola (Anchieta leg. teste Barboza du Bocage).

Ob beide Arten geographisch variieren, weiss man bisher noch nicht. Nach der Grösse angeordnet messen:

H. ayresii ♂ Spanisch Guinea 326, Süd-Somaliland 333, Südafrika 338 mm.;¹ ♀ Süd-Somaliland 360, Kamerun 388, Deutsch-Ostafrika 400, Zondagrivier 420 mm.

H. spilogaster ♂ Windhuk 398, Britisch Betschuanaland 415, Nord-Somaliland 428 mm.; ♀ Abessinien 436, Nord-Somaliland 449, "Südafrika" 468 mm.²

Ein gänzlich anderer Vogel als diese beiden *Hieraaëtus*-Arten ist *Spizaëtus africanus*, und es ist unverständlich, dass er so lange damit verwechselt werden konnte. In seinem ganzen Bau macht er einen geradezu plumpen Eindruck. Es ist ein kurzflügliger Vogel, dem Schwingenmass nach nur mit *H. ayresii*, nicht mit *H. spilogaster* zu verwechseln, aber die Flügel sind im Verhältnis zum Schwanz viel kürzer (Index 63.2–71.2 gegen 50.0–53.7!). Der Fuss ist viel massiger, gedrungener gebaut; bei geschlossenem Fuss und gestreckten Zehen berührt der Nagel der Hinterzehe den der Mittelzehe etwa in der Mitte des letzteren, während bei *H. ayresii* der Hinterzehennagel auf den Endballen der Mittelzehe trifft. Die Handschwingen sind nicht schwarz wie bei *H. ayresii*, sondern dunkel haarbraun mit einigen weit von einanderstehenden schmalen schwärzlichen Binden. Iris nicht gelb, sondern braun (v. Oertzen) oder blassgelb und dunkelbraun (Bates).

Die Färbung des Alterkleides ist von W. L. Selater kürzlich genau beschrieben worden. Auch im Jugendkleid ist *S. africanus* völlig anders gefärbt als die *Hieraaëtus*-Arten. Er hat dann eine auffällige Ähnlichkeit mit dem jungen *Dryotriorchis spectabilis*, doch sind die schwarzbraunen Flecken, welche jede Feder der Unterseite zeichnen, kleiner und Oberkopf, Kopfseiten und Nacken hell rostfarben getönt.

Man kennt diese Art nur von Westafrika, wo sie zwischen dem Unterlauf des Kongo und Togo nicht allzu selten zu sein scheint und ostwärts mindestens bis zum Uelle-Distrikt (Niäpu, J. P. Chapin leg.) verbreitet ist.

¹ Layard, *The Birds of South Africa* (London, 1867), p. 14 [13*].

² Stark & Selater, *The Birds of South Africa*, iii. 1903, p. 300 [18.3*].

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ON THE WEST AFRICAN LYMANTRIID GENUS *NYCTEMERA* [=*OTROEDA* (LEP. HET.)]

By DR. KARL JORDAN.

(With text-figs. 1-18.)

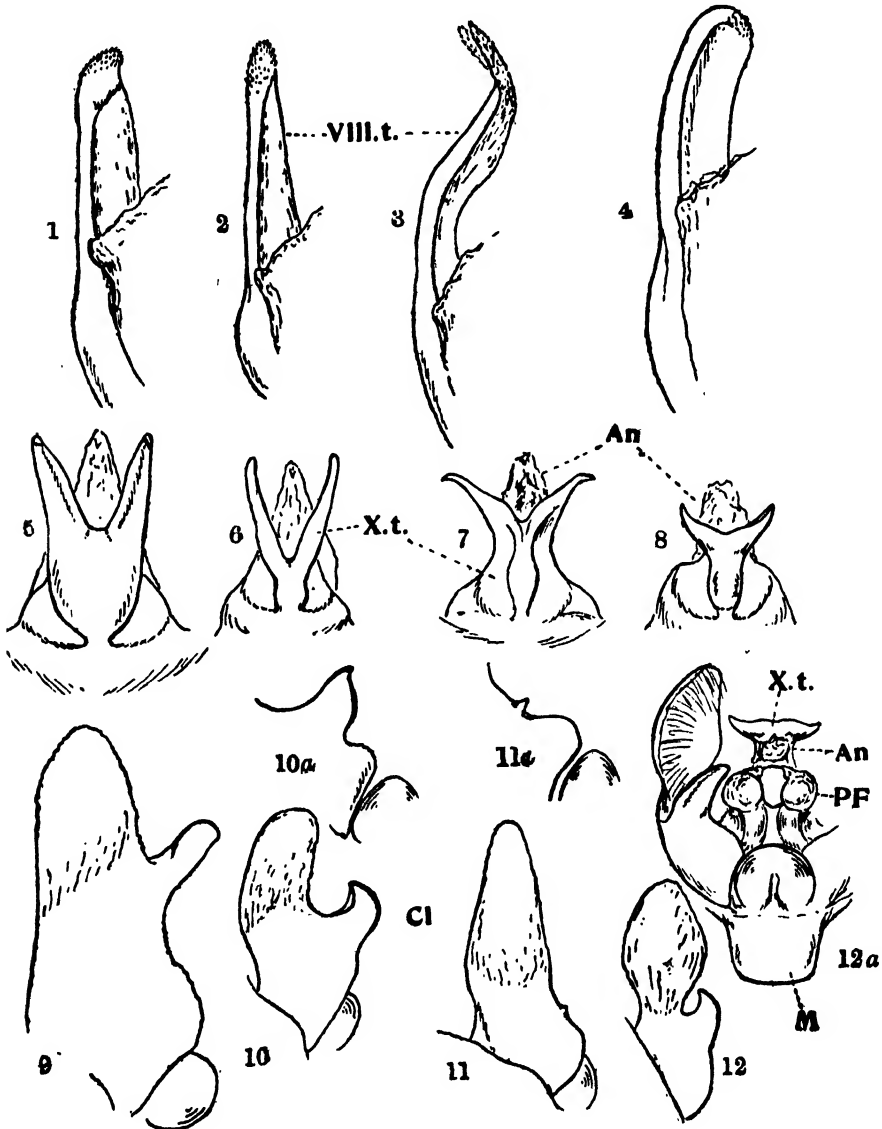
SOME time ago Professor E. Study, of Bonn, asked me for information about the relationship of the various forms of *Nyctemera*, which were of interest to him in his researches on Mimicry. As I could not find any satisfactory account of the classification of these *Lymantriidae*, I had to consult the specimens themselves, and found that in this instance Nature had taken pity on the systematist by creating species which expose in both sexes very easily visible structural differences. But it seemed as if Nature had repented of this kindness, and had counteracted the simplification of systematics by rendering some species practically identical in colouring and pattern, and others so very variable that some individuals look as if they represented different species.

The species of *Nyctemera* fly by day in bright sunshine, even at the hottest hours, and when on the wing, have the appearance of butterflies. It is therefore quite natural that one should think of a mimetic connection with certain *Rhopalocera*. The flight is very fast, rather high above the ground, and according to Neave's observation straight on, which seems to indicate that these moths can very well hold their own and therefore may be regarded as models rather than mimics of butterflies. However that may be—without detailed observations in the field we cannot get beyond arguments—so much is certain that there is a remarkable similarity between the ♀ of *Cymothoë beckeri* with an orange area on the hindwing and the white *Nyctemeræ*, and between orange-red ♀♀ of *Papilio dardanus*, *Nyctemera permagnifica* and a new species described below.

The early stages are not known, with the exception of the egg, which is often found protruding from or fastened to the end of the abdomen. It is almost regularly globular and very minutely reticulated (Aurivillius); the lines of the net are very feebly raised, and the meshes mostly rounded-hexagonal.

As regards the name of the genus I agree with Swinhoe (1903) and Aurivillius (1905) that the Hübnerian diagnosis of *Nyctemera* applies to the first three species placed by Hübner under that name, and not to the other four, which belong to *Deilemera*.

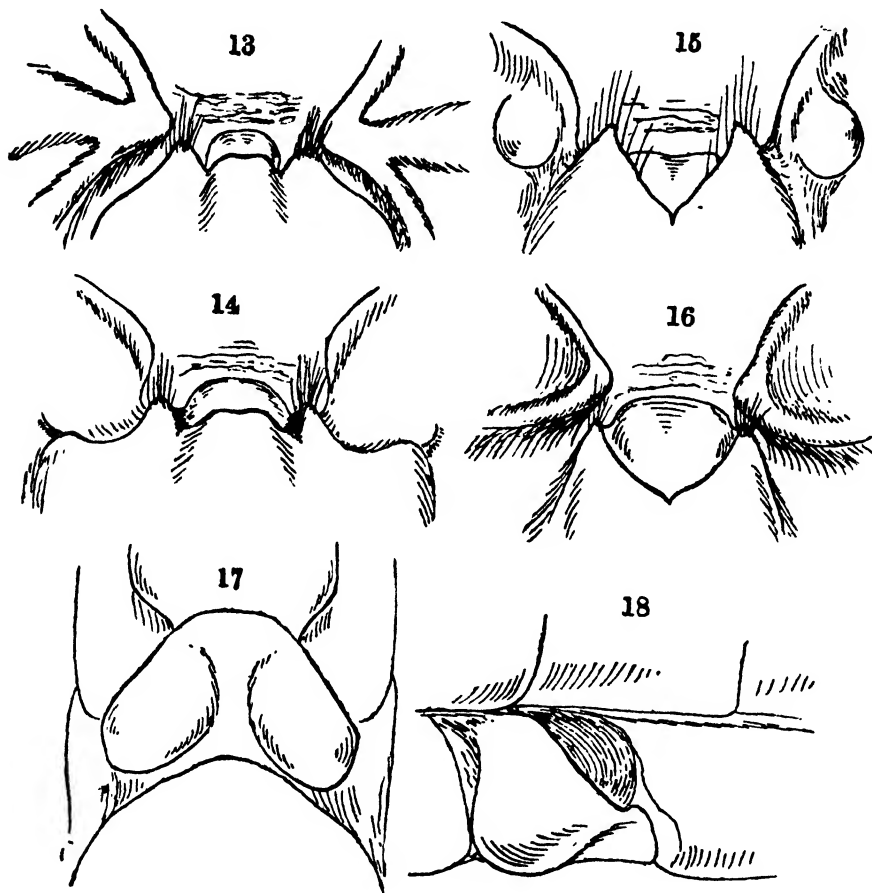
The ♂♂ of *Nyctemera* are distinguished by the possession of a peculiar abdominal organ, the function of which remains as yet obscure to me. The sternite of the third segment (text-figs. 17, 18) is strongly inflated on each side, and behind this bladder-like swelling, the upper margin of which runs obliquely backward-ventrad, there is a cavity which deeply penetrates into the abdomen; it is large and open outwardly and narrow and slit-like inwardly. The outer



wall of the cavity, which is the inner wall of the bladder, bears no scales and appears to be delicate. There is no tuft of hairs in connection with the cavity, nor do the legs show any modification which might suggest a function of the bladder and groove. The structure is apparently the same in all the species, except that the bladders and cavities are smaller in *N. cafra* and *N. permagnifica*.

The structure of the organs of copulation is on the whole very uniform, but each species has its peculiarities, visible without minute preparation, the

organs being well exposed. The eighth abdominal segment of the ♂ has no pleural suture; but there is at the base an impression and at the apex a feeble sinus which indicate the separation of the segment into a tergite and a sternite. The tergite partly assumes the function which generally has the tenth (= anal) tergite; it is distinguished by being very long and incrassate along the middle, a sharply defined median ridge being formed which extends far beyond the margin of the segment as a free process projecting backwards and, of course, being without a joint (text-figs. 1-4, viii. t.). The eighth sternite (viii. st.) is medianly incised in most species. Beneath the viii. t. and more or less concealed by it there is the anal tergite (x. t., text-fig. 6, dorsal aspect); it is always



divided into two processes, and is visible when the specimen (undissected) is examined from behind under the binocular microscope. There is no anal sternite; the anal cone (anus) is long. The clasper (text-figs. 9-12) is large, broad, with or without ventral tooth or finger; between the bases of the clasper there is a round median hump; the manubrium of the ninth sternite, the so-called saccus, is short, compressed in a dorso-ventral sense, rounded (text-fig. 12a, M). The penis-sheath is without special armature; the margins of the opening from which it protrudes are raised ventrally and laterally, forming the penis-funnel (P-F).

The external genital sclerite of ♀ likewise exposed (text-figs. 13-16); aperture median, the ridges and folds different according to species.

Nyctemera Hübn. (1822).

Phalaena Geometra L., Cram., *Pap. Exot.* iii. p. 175 (1779).

Nyctemera Hübner, *Verz. bek. Schmett.* p. 178 (1822) (partim); Swinh., *Trans. Ent. Soc. Lond.* pp. 53 and 433 (1903); Auriv., *Arkiv Zool.* ii. 4. pp. 39 and 65 (1905).

Otroeda Walker, *Lep. Het. B. M.* ii. p. 402 (1854); Kirby, *Cat. Lep. Het.* p. 428 (1892).

As Aurivillius has published, *l.c.*, a key to the African genera of *Lymantriidae*, it is unnecessary to give here a diagnosis. The species which belong to this genus are all large. In spite of the great variability of some of them the submarginal spots always remain white even if the upper surface of the wings is otherwise all yellow, orange, or orange-red, i.e. the bright-coloured forms have a *Phaegorista* coloration.

The area of distribution of the genus extends from Sierra Leone to Angola eastward to the east side of Lake Nyasa, that is to say, the genus belongs to the forest region, the species flying in the open jungle and at the edge of the forest.

1. **Nyctemera nerina** Drury (1780) (text-figs. 1, 13).

♂. *Phalaena Bombyx nerina* Drury, *Illustr. Exot. Ent.* iii. p. 6 and Index, tab. 5, fig. 2 (1780) (Sierra Leone).

♂. *Callimorpha (P) nerina* Drury, Westw., in Drury, *l.c.* p. 6 (1837).

♂. *Otroeda nerina* Drury, Walk., *Lep. Het. B. M.* ii. p. 402 (1854).

♀. *Otroeda occidentis* Walk., *l.c.* p. 403. no. 2 (1854) (Sierra Leone); Butl., *Illustr. Typ. Spec. Lep. Het. B. M.* i. p. 58. tab. 14. fig. 6 (1877); Swinh., *l.c.* p. 434 (1904) (partim; "♂" type ex err.).

♂♀. Sexually dimorphic.—♂. Upperside of forewing black, with thin white longitudinal stripes in the basal area, white median and discal bands narrow, dusted with black; hindwing dull yellowish, suffused with black, the yellowish tint disappearing towards base. Underside of forewing almost as upper, the white bands purer white and the white streaks in basal area somewhat broader; hindwing orange-yellow from terminal band towards base, this colour proximally gradually disappearing, centrally often extending to near base, second submarginal spot large, entirely within the terminal band.

♀. Forewing, above, almost as in ♂, but the white bands not suffused with black, the white discal band as in ♂ not reaching tornus; hindwing white, blackish at base and at costal and abdominal margins, the orange patch small, narrow, the black terminal band broad, measured at R' broader than its distance from cell. Underside as upper; hindwing purer white, its costal margin black.

Genitalia.—♂: process of viii. t. (text-fig. 1) almost straight, apically rough with spiniform teeth, somewhat rounded-convex before apex, the apex split in median line, dorsally convex in lateral aspect, ventrally concave or straight, median incision extended to below middle of process, but only distinct if the two halves are bent apart with the help of a flat needle. Prongs of x. t. (text-fig. 5) rather broad, gradually narrowing, divergent at an acute angle, dorso-laterally convex, interno-ventrally concave, apex curved down. Clasper (text-fig. 9, lateral aspect) similar to a boxing-glove; ventral margin proximally rounded-dilated, distally of middle with a thumb-like process.—♀: ventral genital sclerite (text-fig. 13) rounded at sides, apically strongly narrowed, apical margin in front of cavity tripartite, consisting of a larger, rounded or emarginate, median portion and a small, pointed, setiferous, lateral cone; this anterior wall of the cavity higher than the rounded posterior wall. Lateral sclerite

separated from the ventral one by a deep oblique groove, the anterior margin and the middle of the sclerite swollen, these two dorso-ventral swellings and the posterior margin converging ventrally.

A fairly constant species, occurring in Sierra Leone and at the Gold Coast.

2. *Nyctemera planax* spec. nov. (text-figs. 2, 14, 17, 18).

Otroeda hesperia aut. nec Cram. (partim.¹)

? *Nyctemera hesperia* Cram. ab. *eremitana* Strand, *Arch. Naturg.* lxxx. A. 1. p. 42 (1914) (Cameroon).

♂♀. Nearest to the previous species in the genitalia, but not sharply separated in colouring from the two following species.

Very variable in size, colour and markings, occurring in two principal colour-forms:

♂♀—*f. albida*: like *N. hesperia*, less constant, the white median band of forewing a little more distal, and the posterior two black longitudinal streaks usually abbreviated distally, terminal border of hindwing mostly a little narrower.

♂—*f. fumosa*: only known in ♂; not distinguishable from dark specimens of *N. vesperina jonesi*. Transitions exist between the lightest and darkest specimens. Very dark ♂♂ are apparently rarer than white ones at the Gold Coast and in Nigeria, and commoner in Cameroon and Gaboon; in the dark specimens the white bands are reduced in width and often in length and more or less densely suffused with black, the black basal streaks are widened, the hindwing is shaded with black above and the orange area suppressed on the upperside; the white portions shaded with black also beneath. A single white specimen (♂) from North Nigeria has the hindwing yellow to near base.

Genitalia.—♂: process of viii. t. (text-fig. 2) almost straight, very deeply cleft, but the two halves appressed to each other, apex dentate above and below, somewhat pointed in a lateral view. Prongs of x. t. (text-fig. 6) slender, almost of even thickness from base, apex slightly bent down, not pointed. Immediately behind the subbasal widened part of the clasper (text-figs. 10, 10a) a large claw-like tooth, of which the lower (= proximal) margin is convex, and the upper (= posterior) margin concave, with sharply pointed apex; the sinus between tooth and apical lobe of clasper broadly rounded (text-fig. 10, lateral aspect). ♀: genital armature (text-fig. 14) nearest to that of *N. nerina*; ventral sclerite proximally broader, less rounded at sides, the excisions of the apical margin which separate the setiferous lateral cones from the median lobe deeper, the hindmargin of the genital cavity higher and so joining the setiferous cones that the latter are more part of this posterior ridge than of the anterior ridge of the cavity. Lateral sclerite without dorso-ventral median swelling; the groove separating this sclerite from the ventral one much less deep than in *N. nerina*.

Length of forewing: ♂ 34–31 mm., ♀ 33–55 mm.

Distributed from the Gold Coast to the Congo and North Loanda.

At the Gold Coast the *f. albida* is the usual one; in specimens from that district the black streaks in the basal area of the forewing are abbreviated as a rule, whereas in specimens of *f. albida* from the southern districts (Lagos southwards) the posterior two streaks reach the black median band; in southern

¹ I abstain from quoting all the literature, as it is often quite impossible to know which species the various authors had before them.

examples, moreover, the orange area is usually larger and more intense. The specimen named by Strand ab. *eremitana* is before me ; it is a ♀ without abdomen and evidently belongs to this variable species ; but as it is essential to examine the tail-end in order to place a specimen correctly, my identification remains doubtful to some extent.

3. *Nyctemera hesperia* Cram. (1779) (text-figs. 3, 15).

♂♀. *Phalaena Geometra hesperia* Cram., *Pap. Exot.* iii. pp. 100 and 175. tab. 251. figs. A.♀, B.♂ (1779) (Delmina, Guinea).

Otroeda hesperia Cr., Walk., *l.c.* p. 402 (1854) (pt.).

Nyctemera hesperia Cr., Swinh., *l.c.* p. 433 (1903) (pt.).

♂♀. The white stripes and bands of the forewing and the white hindwing are never shaded with black, and the orange patch of the hindwing is always distinct and usually narrow ; the posterior two black streaks of the forewing reach to the termen, and the terminal border of the hindwing is as a rule broader than in *N. planax*.

Genitalia.—♂ : process of viii. t. (text-fig. 3) long, deeply cleft, densely dentate at apex and curved upwards, usually the two halves divergent at apex. Prongs of x. t. (text-fig. 7) pointed, directed sideways and downwards. Clasper with broad, rounded, proximal dilatation, which is closely applied to the bladder-like hump of ix. st. (text-figs. 11, lateral aspect, and 11a, ventral aspect) ; behind this wide portion a small tooth which is only visible after the eighth sternite has been bent back ; apical lobe of clasper much longer than in the allied species, gradually narrowing.—♀ : hindmargin of genital cavity much lower than anterior ridge (text-fig. 15), the latter with deep, triangular, median incision, the sclerite being thus divided into two triangles of which the setiferous apices are directed anad. Lateral sclerite with large rounded ventral swelling.

Sierra Leone and Gold Coast.—The specimens recorded under the name of *hesperia* from more southern localities belong either to *N. planax* or to *N. vesperina jonesi*.

4. *Nyctemera vesperina* Walk. (1854) (text-figs. 4, 16).

♂. *Otroeda vesperina* Walk., *l.c.* p. 408. no. 3 (1854) (Congo).

An extraordinarily variable species, the wings of which may have the ground-colour white, black or orange. In the northern districts occur only white and blackened specimens, in the most southern districts only orange ones.

The orange specimens and the ♀♀ with black dusting on the white ground of the hindwing can easily be separated from the previous species, but the ♂♂ with black hindwings are exactly like the *f. fumosa* of *N. planax* (apart from the genitalia), except that some specimens have more orange on the hindwing ; and the white specimens agree with the *f. albida* of *N. planax*, but have mostly a somewhat broader terminal band on the hindwing. The orange patch is larger than in *N. hesperia*, which does not occur in the districts where *N. vesperina* is found.

Genitalia.—♂ : process of viii. t. compressed, the dorsal ridge bounded at the sides by a longitudinal channel and almost cylindrical, with the exception of its base ; apex not cleft, or the incision not deep, dorsally sulcate, broad in a dorso-lateral sense (text-fig. 4) and rounded in a lateral aspect, sometimes

somewhat swollen at the sides, ventrally denticulate. Median incision of viii. st. reaching at most to apical third. Prongs of x. t. short, sharp, directed side- and downwards, sometimes their inner margin widened as a sharp ridge. Clasper (text-fig. 12, lateral aspect) with a large tooth, which is almost symmetrical in a ventral view (text-fig. 12a); the sinus between the tooth and the elliptical apical lobe of the clasper much smaller than in *N. planax* (text-fig. 10). Penis-funnel (text-fig. 12a, P-F) laterally swollen and posteriorly more or less rugate or denticulate.—♀: ventral sclerite deeply excised in middle, usually the excision more rounded than in text-fig. 16 and without the median incision, rarely the margin in the centre of the excision a little produced, recalling to a slight extent *N. planax*-♀; the posterior margin of the cavity much higher than in *N. hesperia*, the setiferous projections quite short. The anterior and posterior margins of the lateral sclerite raised, the median surface concave; the groove separating the lateral and ventral sclerites deep.

Distributed from Lagos to Loanda and eastwards to the south side of Lake Tanganyika.

It is not yet possible to decide how many local races there are in this species; the survey here presented must be considered as preliminary.

a. *N. vesperina jonesi* Sharpe (1891).

♂. *Otroeda jonesi* Sharpe, *Ann. Mag. N. H.* (6). vii. p. 134 (1891) (Ogové R.).

♂♀. Ground-colour white. In both sexes occur white specimens (*f. albida*) and black or blackish ones (*f. fumosa*). All examples I have seen from Lagos and South Nigeria belong to *f. albida*; perhaps *f. fumosa* will yet be discovered in those districts. *f. albida* also occurs in Gaboon (and perhaps elsewhere). The type of *jonesi*, which is in the Tring Museum, belongs to *f. fumosa*; it bears on the hindwing a short blackish transverse line between upper cell-angle and terminal band.

In the ♂ of *f. fumosa* the hindwing is densely shaded with black on the upperside, below the darkening is less intense. In the *f. fumosa*-♀ the hindwing, above, is more or less shaded with black, but remains to a great extent white.

Lagos to Gaboon.

b. *N. vesperina vesperina* Walk. (1854).

♂. *Otroeda vesperina* Walker, *Lc.* (1854) (Congo); Butl., *Illustr. Typ. Specim. Lep. Het.* i. p. 58. tab. 14. fig. 7 (1877).

♀. *Otroeda varunaea* Druce, *Proc. Zool. Soc. Lond.* p. 780 (1882) (Kakongo).

Nyctemera varunaea Druce, *Swinh., Lc.* p. 434 (1903) (type "♂" ex err.).

♂♀. Wings orange, forewing of ♂ with black rays in basal area, these stripes usually indicated in ♀; black oblique bands very variable in length and width, sometimes hardly reaching middle in ♀. In ♀ the anterior submarginal spots of forewing more or less enlarged, and the second spot of hindwing not entirely within the black terminal band.

Congo and Loanda.

In type of *varunaea*, a small ♀ (forewing 35 mm.), the terminal band of the hindwing is so narrow that none of the submarginal spots are entirely separated from the orange area. Other specimens of both sexes from the same

locality (Kakongo) do not share this peculiarity; a ♂ from Kakongo (ex. coll. Druce) agrees well with Butler's figure of *vesperina*.

c. *N. vesperina tenuimargo* Prout (1918).

Nyctemera varunaea Druce, Hamps. (error determinationis), *Proc. Zool. Soc. Lond.* p. 458 (1910) (Katanga, Kambove, Lualaba; diurnal).

♂. *Otroeda varunaea tenuimargo* Prout, *Ann. Mag. N. H.* (9). i. p. 318 (1918) (Abercorn).

♂♀. Body and wings orange. Forewing without black streaks from base, the anterior submarginal spots not much enlarged, the outer orange band broader at R¹ than the black terminal border; on hindwing of ♀ all the submarginal spots are within the black border.

Lualaba and south end of Lake Tanganyika.

In type-specimen (Mus. Joicey) there are only 3 submarginal spots within the black border of the forewing, in a second specimen from the same district 4, and in the ♂♂ from the Lualaba country (A. S. Neave) 4 or 5. The length of the two oblique black bands of the forewing is very variable.

5. *Nyctemera manifesta* Swinh. (1903).

♂. *N. manifesta* Swinh., *l.c.* (Congo).

♂. Similar to the *f. albida* of *N. v. jonesi*, but creamy white and the row of submarginal spots of the forewing more regular, first spot somewhat larger than second and less shifted basad than in the other white species, at base long black rays; hindwing entirely without orange. Genitalia as in *N. vesperina*, apex of viii. t. rather less rounded.—Perhaps only a white form of *N. vesperina vesperina*?

"Congo" and Landane, Congo; two ♂♂ in Mus. Brit.

6. *Nyctemera papilionaris* spec. nov.

♂. In colour similar to *N. permagnifica*, but much paler orange, more like *N. vesperina tenuimargo*. Forewing: costal edge black, widened into a largish spot at apex of cell, halfway to base a short black line before cell, black terminal border about as broad as in *N. vesperina*, measured along R¹ 14 mm. broad and 8 mm. distant from cell; a row of white submarginal spots, of which the second is the largest, 6 mm. long and 3 broad, at ends of veins in posterior half of margin a minute white dot. Terminal band of hindwing 12 mm. broad at SC¹ and 7 mm. at M¹, indented on the veins; eight submarginal spots, first minute, second a little larger than third, measuring 2 × 3 mm., the others gradually decreasing in size, with the exception of the second all placed nearer to the termen than to the inner edge of the border, second 3 mm. distant from orange area, a white dot at end of each vein (except costa), all small, 1, 2, 4, 5 the largest. Underside as upper, except that the black edge of the costal margin of forewing is a little broader and that there is at costal margin of hindwing a longer black line extending from terminal border towards base, which it does not reach; hindwing narrower than in the other species, 37 mm. long and 23 mm. broad.

Body grey, with black dorsal line and orange base, underside black, apices of segments yellowish grey. Branches of antenna shorter than in *N. vesperina*,

but the apical ones comparatively long, not so short as in *N. permagnifica* and *N. cafra*.

Genitalia.—♂: process of viii. t. broad, gradually narrowing, the membranous sides expanding obliquely in roof-shape, the median ridge smooth, convex, apically widened, not slit, but divided by a small rounded sinus into two short lobes, the apex curved down in a lateral aspect. Incision of viii. st. extending to apical third. x. t. with high dorsal hump, which leans somewhat anad; the transverse apical margin in between the two horns slightly convex-rounded, the prongs short, pointed. Clasper with long sharp antemedian process curved upwards. Penis-funnel on right and left side high, swollen and densely denticulate.

♀. Similar to ♂, wings shorter.

In Mus. Tring one ♂ from Bopoto, Upper Congo (Kenred Smith); in Mus. Berlin a ♀ from the Lualaba-Kassai district.

7. *Nyctemera permagnifica* Holl. (1893).

♀. *Otroeda permagnifica* Holland, *Psyche* vi. p. 413. no. 65 (1893) (Ogové R.).

♂♀. Wings orange red, much more deeply tinted than the orange specimens of *N. vesperina*. Forewing without oblique bands, but with the black border very broad anteriorly, reaching apex of cell; in this border white markings as follows: near its proximal margin below costa a short row or band, very variable (absent in type), a submarginal row of spots of which 2 and 3 are small or 2 absent, 4 being the largest, and an admarginal row of small linear spots placed in pairs, each pair forming an incomplete angle, as in many butterflies; no marginal spots. Terminal band of hindwing about as broad as in *N. vesperina vesperina*, with a row of white submarginal spots, all well within the black border, and small white admarginal ones.

On abdomen a broad dorsal stripe and large ventral spots black. SC² and R¹ of hindwing from a point or (as in *N. cafra*) on a short stalk. Distal segments of antennae with short branches as in *N. cafra*. Genitalia also similar to those of *N. cafra*.

Only a few specimens known.

In Mus. Brit. two ♂♂ ex Mus. Joicey, and a pair in Mus. Joicey, all from Bitje, Cameroón (Bates). Type specimen from Ogové R.

I am very much indebted to my kind friend Dr. Holland for sending me a coloured sketch of the type of this beautiful species.

8. *Nyctemera cafra* Drury (1780).

♂. *Phalaena Bombyx cafra* Drury, *Illustr. Exot. Ent.* iii. p. 5 and Index, tab. 5. fig. 1 (1780) (Sierra Leone).

Nyctemera cafra Drury, Hübner, *Verz. bek. Schmett.* p. 178 (1822).

Callimorpha ? *cafra* Drury, Westw., in Drury, *l.c.* iii. p. 6 (1837).

Otroeda cafra Drury, Walk., *Lep. Het. B. M.* ii. p. 404. no. 4 (1854).

In hindwing SC² and R¹ on a stalk, which rarely occurs in other species, and the lower portion of the angulate cross-vein longer and more oblique than is usual. The bladder-like abdominal organ of ♂ smaller. The last segments of the antennae with shorter branches, particularly in ♀.

A nuchal ring and the underside of the foretibia red, sometimes in ♀ the

submarginal spots of the underside of hindwing and occasionally the larger portion of both wings red ; in Nyasaland occur specimens with yellow hindwing.

Genitalia.—♂: process of viii. t. long and slender, first somewhat curved downwards and then gradually upwards, ending in two short diverging points, recalling *N. hesperia*. Viii. st. without median incision. Prongs of x. t. short, almost cylindrical, directed sideways. Clasper broad, irregularly narrowing apicad, the apex itself somewhat widened and more strongly chitinated, brown, truncate, setiferous and slightly denticulate.—♀: genital aperture elongate-ovate, without raised posterior margin, its anterior edge concealed by the seventh sternite, the lateral margins simple. Right and left lateral sclerites much wrinkled, contiguous in middle line, only separated from each other by a narrow groove running from the genital aperture anad.

Sierra Leone to east side of Lake Nyasa.

9. *Nyctemera catenata* spec. nov.

♀. General colouring of the *hesperia* type, but hindwing with a discal line of black spots.—Forewing: distal margin distinctly incurved below apex, which projects a little ; at base a white costal dot sharply outlined with black, between this black ring and the black antemedian band the costal margin white, only the extreme edge and the costal vein black ; the two black oblique bands widening costally, sharply defined throughout, posteriorly united in a curve, the last partition of the discal band projecting inward as a tooth, basal area with two black streaks in cell and three between cell and hind margin, all thin, the third and fourth extending to antemedian band ; five submarginal white spots, the three anterior ones round, the other two truncate on proximal side.—Hindwing: white, a curved discal band black, narrow, curved, interrupted at veins R^1 to M^1 , ending near anal angle, crossing R^1 6 mm. from cell, commencing at costal margin 21 mm. from base and 11 from apex of costal vein ; a row of submarginal spots, round, posterior ones small, bounded with black, which forms a chain and on the proximal side is convex between the veins and on the outer side is produced to the margin, these projections separating white semi-circular marginal spots from each other ; between the black chain and the discal line the scaling orange from anal angle, this colour fading away about middle.—Scales of both wings above and below, inclusive of fringe and orange area, narrower than in the other species of the genus, nearly all bidentate. Tegulae with sharply defined white margins.

Genital sclerite quite exposed, with the opening in centre of the ventral surface, not bounded by an elevate ridge, triangular, narrowing anteriorly ; the posterior edge of the sclerite free, bidentate, thrice slightly incurved, lateral angles rounded ; sides of sclerite setiferous.

Length of forewing : 49 mm.

Hab. Kakongo, North Loanda (Hudson Moore) ; one ♀ in Mus. J. J. Joicey. The wings are glossy, semivitreous, partly on account of the narrowness of the scales, partly because the specimen is a good deal worn.

ANTHRIBIDAE FROM THE ISLAND OF RODRIGUEZ

By DR. KARL JORDAN.

THE *Anthribidae* of which I give here a list were collected on Rodriguez by Mr. H. P. Thomasset and Mr. H. J. Snell between August and November 1918.¹ The collection contains ten species, of which no fewer than four are new, one of them representing a new genus. The *Anthribidae* are similar to those from the Seychelles, the majority of them being of very small size. The types of the new species are in the British Museum. I am much obliged to Dr. Hugh Scott for a set of specimens presented to our collection.

The only *Anthribidae* recorded from Rodriguez are the two species described by Waterhouse in *Ann. Mag. N.H.* (4) xviii. p. 118-120 (1876), both of which are contained in the present collection.

1. *Phloeobius gigas cervinus* Klug (1833).

Three ♂♂, four ♀♀.

2. *Hormiscops thomasseti* spec. nov.

♂♀. Rufo-brunneus, pube luteo-grisea variegatus, fronte dimidio rostri aequilata, oculo sinuato, carina prothoracicali lateribus gradatim antrorsum flexa.

Long. (cap. excl.) 1.8-2.7 mm.

A series.

Body rufescent brown, pubescent luteous grey, underside and pygidium unicolorous, upperside variegated with brown, usually the greater portion of the disc of the pronotum and a variable median patch on each elytrum brown, legs and base of antenna pale rufous, middle of femora and the tarsi brown. Sinus of eye very distinct; head reticulate-rugate, the lines not much raised; pronotum coriaceous, somewhat rugate, apex almost smooth, carina gradually curved forward at sides, without forming a distinct angle. Elytra half as long again as broad, cylindrical, with no impressed lines besides the sutural line, but in basal half with lines of punctures, no punctures in apical half. Pygidium smooth in ♂, rugate in ♀, white.

3. *Balanodes tomentosus* Waterh. (1876).

A series.

4. *Araecerus suturalis* Boh. (1839).

A large series. The species is common in India. The ♂ is easily recognised by the long pygidium.

Dinephrius gen. nov.

♂. A genere *Caranistes* dicto differt oculis magnis sinuatis.

Genotype: *D. annulatus* Waterh. (1876, as *Caranistes*).

The antennae bear long bristles on the shaft and club. The eyes are longer

¹ Cf. *Ann. Mag. N. H.* (9) xii. p. 330 (1923).

than broad and have a narrow but rather deep sinus above the antennal groove; they are as widely apart as the antennal grooves or nearer together (the frons probably being broader in the ♀♀). Pygidium large, rounded at apex, with the apical margin incurved.

5. *Dinephrius annulatus* Waterh. (1876).

Only one ♂. Eyes as far apart as the antennal grooves.

I take the opportunity of describing a closely allied species from Mauritius (Ile de France):

Dinephrius mauritius spec. nov.

♂. Frons capitis multo angustior; tibiae apice pallidae; tarsorum segmenti primi dimidium basale brunneum.

Long. 4.5–5 mm.

In *D. annulatus* the apices of the tibiae and the apical half of the first tarsal segment are dark brown, in *D. mauritius* the brown postmedian ring of the tibiae is narrow and does not extend to the apex, and the basal half of the first tarsal segment is pale testaceous, while the apical half is brown. The eyes are much closer together in *D. mauritius*, the frons being less than half as broad as the space between the antennal grooves. Moreover, the pygidium of *D. mauritius* is a little longer.

Talpella gen. nov.

♀. *Scirtetino* Jord. (1914) affinis, pubescentia sparsissima vestita, carina prothoracicali lateribus gradatim antrorsum flexa, unguiculis edentatis.

The tooth of the mandible is a little farther away from the apex than in *Scirtetinus*. The species on which I base this genus is similar in shape to *Sc. dimidiatus* Jord. (1914), recalling by the proportions of its body the Brazilian *Hypocephalus armatus* Desm. (1832) and the Mole Cricket.

6. *Talpella atra* spec. nov.

♀. *Atra* vel piceo-atra, antennarum basi atque tarsis pallide luteis; capite reticulato; pronoto transversim densissime seriatim punctato; elytris fortissime striato-punctatis; pygidio punctis grossis notato apice glabro.

Long. 1.5 mm.

Three ♀♀.

One of the specimens is glossy black with a very slight pitchy tint, the mouth-parts, base of antenna and the tarsi pale luteous; in a second the mesosternum and part of the tibiae, and in the third example the mesometasterna, abdomen inclusive of pygidium and the legs, are luteous. Proportions of antennal segments as in *Scirtetinus*. Head and rostrum covered with a net of hexagonal meshes, each bearing a minute central puncture, about 5 meshes between antennal grooves. Prothorax rather larger than the rest of the body, with long punctures beneath, but above densely covered with short transverse rows of confluent punctures, many of the rows joined together, which gives the pronotum the appearance of being transversely rugate-plicate; carina antebasal, gradually curved forward at sides, without indication of an angle. Elytra rather narrower than pronotum, coarsely punctate-striate, interspaces convex, the basal half of the suture and the posterior half of the third interspace distinctly elevate.

Pygidium broader than long, triangular, with the apex rounded off. Sterna and abdomen coarsely punctate.

Pubescence very sparse, silky, distinct under a high power, each puncture evidently bearing a hair, the hairs lying flat on the derm.

7. *Homoeodera snelli* spec. nov.

♂. Atra, nitida, supra squamis elongatis albis dispersis vestita, antennarum basi, tibiis tarsisque pallide rufis, pronoto densiter punctato, elytris punctis magnis seriatim dispositis, plus triente apicali impunctato.

Long. 1.2 mm.

Two ♂♂.

Head minutely coriaceous, with shallow pits. Segments 9 and 10 of antenna truncate, the apical margin somewhat incurved, one side of the segments much more widened than the other, 9 about as long as broad, longer than 10, which is much broader than long, 11 rounded, nearly circular, with the tip very slightly acuminate. Pronotum as long as broad, as wide at base as at apex, with the sides evenly rounded; minutely coriaceous, densely pitted with large punctures, which are not confluent, apical marginal area without punctures. Elytra cylindrical, one-fourth longer than broad, the sides slightly, the apex in dorsal view very strongly rounded, no impressed stripes, except the sutural one in apical third, basal margin slightly incurved from shoulder to shoulder with the edge raised, shoulder angle well marked in dorsal view, no subbasal callosity, shoulders not elevete, no transverse antemedian depression, from base to beyond middle rows of very large punctures, rather more than the apical third without punctures. Pygidium vertical, slightly inclining cephalad, smooth, nearly semicircular. Prosternum coarsely punctate; proximal abdominal segments with a few large punctures at the base.

In perfect specimens evidently each puncture bears a white scale-hair, which narrows towards base and gradually tapers to a point apically, recalling a short blade of grass. These white scales very conspicuous under a lens.

8. *Achoragus pumilio* spec. nov.

♀. Nigro-piceus, griseo pubescens, antennis pedibusque luteis, elytris etiam pallidis brunneo variis. Oculi grosse granulati. Pronotum minute coriaceum, leviter punctatum, lateribus punctis grossis instructum, angulo carinae obtuso, carina dorsali medio concava. Elytra punctato-striata. Pygidium semicirculare, nitidum, impunctatum.

Long. 1.5–1.8 mm.

Five ♀♀.

Eye much more coarsely granulated than in *A. tener* Jord. (1914), from the Seychelles, and minutely but distinctly sinuate. Pubescence grey, as coarse as in *A. tener*. Head and prothorax brownish black, coriaceous, with large but rather widely separated punctures, which are shallow except at the sides of the pronotum. Carina applied to the basal margins of the elytra, concave medianly, gradually slightly convex towards sides, angle a little more than 90°, not rounded except its extreme tip; no reticulation on head and pronotum. Elytra convex from base to apex and from side to side, nearly half as long again as broad, pale rufous clay, the suture and margins and some variable and ill-defined spaces,

particularly a lateral antemedian patch, darker brown; punctate-striate, the punctures deep, becoming more shallow towards apex. Pygidium semicircular, glossy, with dispersed grey pubescence and without distinct punctures.

Underside sparingly pubescent, glossy; prosternum coarsely punctured; at base and apex of metasternum, laterally, a row of punctures and also at the bases of segments 1 to 4 of abdomen. Legs and antennae very pale, femora more or less pitchy brown.

9. *Achoragus tantillus* spec. nov.

♀. Caput et pronotum reticulata, rostro basi fovea mediana instructo, elytris fortiter punctato-striatis.

Long. 2 mm.

One ♀.

Larger than the preceding species; colouring similar, pubescence rather denser. Distinguished by the longer antenna, of which segments 9 and 10 are elongate-pyriform, 9 being very little longer than 10; by the rostrum bearing a basal median groove and being like head and pronotum covered by a net of meshes, which are very feeble on the disc of the pronotum; by the angle of the pronotal carina being a little sharper, 90° ; and by the stripes of the elytra being more impressed except apically. Differs from *A. tener* in the longer antenna, the presence of the groove on the rostrum, the much less distinctly reticulate pronotum, the much more coarsely punctate-striate elytra, and the smaller pygidium.

10. *Corynecia scotti* Jord. (1914).

One ♂.

The eyes of this specimen are somewhat elongate and oblique, the frons therefore narrowing somewhat towards the rostrum. Possibly a species distinct from *C. scotti*.

NEW ANTHRIBIDAE

By DR. KARL JORDAN.

1. *Acorynus labidus* spec. nov.

♂♀. Similar to *A. passerinus* Pasc. (1860). Rostrum with five carinae extending to antenna. Eyes of ♂ almost contiguous, frons of ♀ not quite so broad as the club of the antenna. Segments 1, 8 (often also 7), base of 9 and tip of 11 very pale, 3 nearly half as long again as 4, 8 much shorter than 9, this triangular, about twice as long as broad, 10 as long as broad, in ♂ 3 to 8 flattened and much wider than in ♀ (and also than ♂ of *A. passerinus*).

Pronotum laterally with dispersed but distinct punctures, disc transversely impressed, markings luteous or grey as on elytra, a median stripe dilated behind apical margin into a rhombiform spot, constricted in the groove and again a short distance in front of the carina and finally, in front of the scutellum, dilated into a square or rounded spot, in the depression on each side a spot which is joined to the median stripe, sides of disc anteriorly with a double spot (anguliform) and in the curve of the carina two spots, which are usually united along the carina.

Elytra strongly punctate-striate, with the interstices rather strongly convex, markings practically as in *A. passerinus*: on the subbasal swelling a brown half-ring joined to a largish sutural patch, nearer the shoulder a brown anguliform spot laterally joined to the brown limbal area, behind the subbasal swellings a large transverse grey patch indented anteriorly and posteriorly, behind middle on each elytrum a smaller indented grey patch, and at apex two or three patches more or less confluent, but often broken up, besides these grey markings a variable number of grey lines, short and long. Pygidium with brown median stripe, which is broader in the ♀ than in the ♂.

Legs pale rufous, pubescent grey, a spot near apex of femora, base and apex of tibiae and of first tarsal segment and the entire second and third tarsal segments dark brown; foretibia of ♂ unarmed.

Length (head excl.) 3–5 mm.¹

Hab. Ceylon: Nalanda and Weligama (Dr. W. Horn); a small series.

2. *Acorynus cruralis* spec. nov.

♂♀. *A. pallipedi* simillimus, sed tibiis quatuor posticis apice nigro-brunneis. Long. 5–6.5 mm.

Hab. Mindanao; a series.

The black dorsal stripes of the pronotum broader than the greyish luteous median stripe, with straight sides, the luteous spot in the centre of the black stripe small. Black spots of elytra larger, more rounded and better defined than in *A. pallipes*, distributed as follows: a postmedian transverse irregular band as in *A. pallipes*, between it and base at side three spots at even distances, the anterior one at shoulder-angle, a largish spot, usually widest behind, is situated

¹ All species measured in a straight line from anterior margin of pronotum to apex of pygidium.

a little before middle halfway between suture and outer margin, before this spot in interspaces 2 and 6 a small spot each, on subbasal swelling a rounded one and another round one behind middle of suture, before apex a small spot, and at basal third of suture usually a small line. Pygidium with black median stripe. Apical half or two-fifths of hindtibia black-brown, of midtibia usually somewhat paler brown; in *A. pallipes* and *A. analis* Jord. (1895) the apices of the tibiae remain pale testaceous, the postmedian black patch not reaching apex.

3. *Litocerus plagiatus vagulus* subsp. nov.

♂♀. Greyish ochraceous median stripe of pronotum as broad as in *A. p. plagiatus* Jord. (1895), from Luzon, often with a pair of black dots between carina and impressed line. On the yellowish basal area of the elytra several short blackish brown lines; the large black lateral area extends in middle, and usually also at apical third, dorsad to first line of punctures, a rounded yellowish spot, thus being almost separated from the basal area, between this spot and the suture a brownish longitudinal streak, usually distinct.

Hab. Philippines: Mindanao (type), Leyte, Masbete; a series.

4. *Litocerus confatalis* spec. nov.

♂♀. Colore praecedentis, sed angulo carinae prothoracicalis rotundato. Long. 4–6 mm.

Hab. Philippines: Iloros Norte, Rangui and Los Banos, on Luzon; a series.

Antenna of ♂ flattened from segment 5. Rufescent brown, base of antennae, legs and light-coloured portions of upper surface testaceous, more or less pale; occiput and pronotum brownish black centrally; on pronotum a large central cross luteous, sides also pubescent luteous, with a black stripe reaching neither apical margin nor carina, variable in size, anteriorly curved down, connected in middle with the black disc, and sometimes interrupted. Elytra pubescent luteous: before middle a transverse, irregular, brown-black band which widens laterally, encloses an antemedian, irregular, lateral, luteous spot, and is constricted in second line of punctures; basal area with irregular, small, brown lines and spots; on apical declivity a large brown-black patch, irregular, anteriorly tridentate, enclosing two or three, separate or confluent, luteous spots, of which the one at the suture is the largest. Pygidium with brown-black median vitta, which widens apically.

Underside grey. A large subapical patch on femora and a large subapical ring on tibiae (complete or beneath open) brown-black, first tarsal segment brown, except extreme base and tip.

All the markings variable.

5. *Litocerus stichus* spec. nov.

♂♀. *L. anatini* Jord. (1901) vicinus, carina dorsali prothoracis medio haud subangulata, angulo laterali distincto, linea grisea suturali completa ante apicem versus limbum curvata, caeteris lineis ante et post medium interruptis; antennarum segmento 9° ultimo parum longiore, 3^o–8^o maris tenuibus, non-dilatatis.

Hab. Cameroons: Johann-Albrechtshöhe (L. Conradt); a small series. A little smaller than *L. anatinus*, which also was collected by Conradt at the

same place ; on the pronotum three grey vittae, besides the grey sides which look like a stripe in dorsal aspect, the median vitta posteriorly dilated, between it and the next stripe a round discal dot or a stripe. The angle of the carina much less rounded than in *L. anatinus*. The grey sutural line touches the suture behind the scutellum and again before the middle, the brown sutural line slightly widened at basal fifth and in middle ; in *L. anatinus* the third grey line curves round at apex to join the ninth line, in *L. stichus* it is the first grey line which curves towards the side, where, however, it does not meet a grey line.

6. *Tropideres bolinus* spec. nov.

♂♀. Very pale rufous, occiput, sides of pronotum and a large lateral area of the elytra, extending from shoulder to beyond middle and dorsally to second line of punctures, brownish black.

Rostrum flat, in basal half with vestiges of carinae, only the lateral carina being fairly distinct. Frons twice as wide in ♀ as in ♂, in the latter one-fourth as wide as the rostrum measured between the antennae ; groove below eye distinct. Antennae rufous, paler at the base, segment 10 shorter than 9.

Pronotum coarsely punctured, with a deep transverse groove ; the pale central area occupies rather less than one-third of the surface, is posteriorly strongly narrowed and bears before the groove two brown spots, convergent anteriorly, and two behind the groove, convergent posteriorly ; dorsal carina convex, with a small median angle pointing backwards, lateral angle of carina rounded, almost semicircular.

Elytra strongly punctate-striate, with the alternate interstices somewhat raised ; subbasal swelling distinct, brown or blackish, this spot separate from the black-brown lateral area or merged together with it ; in this area a few pale dots ; the pale sutural area, which posteriorly extends to the lateral margin, bears a number of brown dots. Pygidium with brown median stripe.

Sides of sterna coarsely punctured. Abdomen brown at the sides, with pale spots. Femora with a small spot in middle and a large one at or near apex, tibiae with the apex and a large antemedian spot brown, first tarsal segment also brown near the base and at the apex.

Length 2.8-3.4 mm.

Hab. Tñano Range and Nagsidh Forest, Dehra Dun, ix. x. 1920 (C. F. C. Beeson) and x. 1921 (N. C. Chatterjee), ex *Shorea robusta*, one ♂, two ♀♀.

7. *Hucus proles balius* subsp. nov.

♂♀. Distinguished by the markings of the elytra : basal sutural spot anguliform, being divided on the suture from behind ; in third interspace two spots, sometimes united as a line, one behind the feeble subbasal swelling, the other in middle, the anterior one sometimes joined to the postscutellar spot (type), obliquely backwards in fifth and seventh interspaces, or in fifth only, a spot or short line, additional spots in third and seventh interspaces before apex, a basal line in third, united sometimes with the antemedian spot of this interspace, above shoulder a basal patch, more or less diffuse, and at sides and suture indications of some small spots.

Hab. Philippines : S. Theodoro, Mindoro ; a small series.

8. *Phaeochrotes anisus* spec. nov.

♂♀. Segmento octavo antennarum multo minus quam in caeteris speciebus dilata diversus.

Long. 2.5–3.5 mm.

Hab. Philippines: Manila; a series.

Nearest to *Ph. phorcas* Jord. (1904), but rostrum broader, in ♂ segment 3 of antenna much shorter, in ♀ 4 and 8 shorter, and in ♂♀ 8 much narrower, the club being triarticulate as in *Plintheria*.

Black-brown, uniformly grey beneath, the tibiae more or less rufescent; upperside of rostrum and head sparsely grey, pronotum with a central row of three markings and at each side of middle another spot (isolated or joined to lateral area) grey, sides likewise grey, bearing a large brown ring enclosing a grey dot. Elytra with numerous grey spots and short lines, all very variable, often confluent, usually the brown ground rather more extended than the grey markings, but sometimes the grey pubescence prevalent. Pygidium grey.

Frons and base of rostrum reticulate, the former two-thirds the width of the apex of the rostrum, rostrum as long as apically broad, flat, slightly impressed in middle, finely wrinkled longitudinally at apex. Eye almost circular. Antennae: segments 3 and 4 together as long as the frons is wide, in ♂ 3 = 5, a very little shorter than 4, in ♀ 3 longer than 4; 9 triangular, a little longer than broad, 10 broader than long, not closely applied to 9, triangular, with the sides somewhat rounded, 11 a little longer than broad, 8 of ♂ flattened, slightly wider than 7, elongate-triangular, twice as long as broad, in ♀ 8 much shorter than 7 and but faintly broader. Pronotum densely granulate-rugate, carina centrally more distinctly curved backwards than in *Ph. porcellus*, lateral angle of carina 90°, with the tip rounded off, lateral carina horizontal, nearly reaching to middle. Elytra punctate-striate.

9. *Plintheria dufouri* Montr. (1860).

Stenocerus dufouri Montrouzier, *Ann. Soc. Fr.* 1860, p. 867 (Lifu).

In coll. Fleutiaux there are two species of *Plintheria* from New Caledonia, of which one may be *dufour*. The description given by Montrouzier does not contain anything which is decisive, except that the size is superior to any of the species before me. I select the more coarsely sculptured species as being *dufour*, because Montrouzier says of the antenna that the first two segments are nearly equal and do not differ in length from those which follow; this description agrees better with the coarsely sculptured species than with the other. On the other hand, the eyes of *dufour* are said to be nearly contiguous, which points to the second species rather than the first. As the dark spaces on the elytra are described as being shiny black, nearly green, which is not the case in either species before me, it is quite possible that true *dufour* is not known to me.

What I here identify provisionally and with doubt as *dufour* has the head strongly reticulate, the frons longitudinally plicate, the rostrum longitudinally rugate-punctate and the pronotum very densely rugate-punctate, the punctures being more or less umbilicate. The frons is half as broad as the rostrum at its narrowest point, and the lateral carina is absent or faintly indicated and then quite short. In ♂ segment 3 of the antenna a little longer than 2, 3 to 7 nearly equal in lengths, 8 slightly shorter, but distinctly broader, as long as 9, but

narrower, 9 about twice as long as broad, 10 a little longer than broad, 11 ovate; in ♀ 3 slightly longer than 2 and 4, 5 to 7 slightly decreasing in lengths, 8 distinctly broader than 3 to 7, club a little shorter than in ♂, 10 being about as long as broad. Sides of metasternum with large deep punctures.

Length 1.8–2.2 (head excl.), width 0.8–1.1 mm. Montrouzier gives as length 3.5 mm. and width 1.8 mm.

10. *Plintheria subtilis* spec. nov.

♂. A little larger and slenderer than the previous; rostrum longer; frons one-third the width of the rostrum at its narrowest point. Occiput and disc of pronotum minutely punctate, very slightly rugose, sides of pronotum more distinctly punctate, but not nearly as coarsely sculptured as in *P. dufouri*; lateral carina distinct, fading away at a slight smooth median dorso-lateral swelling. Elytra longer than in the previous, punctures smaller. Antenna (♂) longer, reaching almost to middle of elytra, segment 3 longer than 1 and 2 together, 3 to 8 decreasing in length, 8 a little longer than 9, not broader than 7, 9 as long as 3, elongate triangular, 10 likewise triangular, about twice as long as broad, 11 elongate-ovate, the club longer than in the previous species.

Length (head excl.) 2.3 mm., width 0.9 mm.

Three specimens: Nouméa to Bourail, and Coulée Boulari, Mont Doré; type in coll. Fleutiaux.

Antioxenus gen. nov.

♂♀. Rostrum latissimum, plus duplo latius quam longius, latius quam caput cum oculis, margine laterali supra-antennali explanato ad oculos continuato. Oculi obliqui ut in *Nessiara*. Mandibulae magnae bisinuatae. Antennae breves, prothoracis basin non attingentes, clava laxa. Pronotum transversum, lateribus bituberculatis, carina dorsali medio concava, angulo laterali obtuso rotundato. Elytra oblonga, dorso concava, singulo ante apicem declivem tuberculo alto instructo. Processus mesosternalis truncatus, medio convexus, lateribus obtuse angulatus.

Near *Nessiara*.

11. *Antioxenus bennigseni* spec. nov.

♂♀. Nigr̃. Rostrum griseum, inaequale, ante oculos macula parva nigra notatum.

Frons capitis medio carinata, gutta ochracea signata; caput pone et sub oculos ochraceum. Antennae rufescentes, clava lata, segmentis 9° et 10° triangularibus latitudine paulo longioribus, 11° elliptico. Pronotum utrinque ante carinam depressum, lateribus ochraceo et griseo notatis, duabus guttis antescutellaribus, una ante, altera post carinam sita, luteo-griseis. Elytra macula magna suturali nigro-velutina et guttis ochraceis ornata, margine basali fortiter rotundato-producto. Pygidium ochraceum, longitudine vix latius, apice aequaliter rotundatum. Subtus albo-griseus, lateribus nigro maculatis, pedibus nigro-annulatis.

Long. 10–12, lat. 5–6 mm.

Hab. New Guinea: Kani Mts. (v. Bennigsen); two ♀♀, one ♂; type (♀) in D. Ent. Mus.; antennae of ♂ broken. The velvety sutural patch of the elytra is partly shaded with tawny and is surrounded by greyish and ochraceous pubes-

cence, partly diffuse, partly concentrated in dots, a row of raised ochraceous dots in interspace 7, and similarly coloured dots before apex in 9. The tibiae are black, with the base, centre and apex grey. The abdomen bears on each side one or two rows of small diffuse blackish spots and a row of sharply defined lateral ones, the greyish white pubescence in between these spots appearing concentrated in patches.

12. *Apatenia fastigata* spec. nov.

♀. *A. viduatae* Pasc. (1859) similis; rostro brevius latiusque, cum fronte capitis obsolete carinato, fronte latius quam illa *A. viduatae*, multiplicata; antennis parum brevioribus, 8° latitudine vix longiore; pronoto longiore, carina dorsali fortiter convexa, angulo laterali acuto; elytris diffuse griseo et nigro tessellatis, macula nigra mediana obsolescente.

Long. 7-7.5 mm.

Hab. Formosa: Kosempo (type) and Fuhosho; two ♀♀; type in D. Ent. Mus.

13. *Commista baccula* spec. nov.

♂♀. Nigra, omnino griseo-ochraceo irrorata. Rostrum crassum, subverticale, longius quam latius, medio late depressum, sulcatum. Caput carina brevi mediana instructum. Antenna (♂) corpore longiores, tenues, segmento 9° octavo multo brevius, 10° fere quadrato, 11° nono brevius conico acuminato. Pronotum dorso depressum, utrinque arcuatim elevatum, tuberculo cariniformi mediano notatum, carina medio interrupta, fortiter concava, versus latera convexa, subangulata, deinde arcuatim antrorsum flexa, trans medium continuata. Elytra oblonga, lateribus subparallelis, latitudine dimidio longiora, confertissime minutissimae granulosa, lateribus punctato-striata, dorso irregulariter subseriatim punctata, decem tuberculis notata, quorum septem magna. Pygidium longitudine latius, late rotundatum, feminae utrinque subconvexum. Tibiae et tarsi hispidi.

Long. 9-13, lat. 45-6 mm.

Hab. New South Wales, type, and Queensland; three ♂♂, one ♀. The antennae of the ♀ are broken; in D. Ent. Mus. a ♀ from Mt. Tambourine, also with the antennae broken.

As in *C. latifrons* Jord. (1895) the antennal scrobes are small and open. In the present species the frons and rostrum form with the occiput almost a right angle; and the round eyes are subdorsal, the frons being much narrower than in *C. latifrons*. The velvety spot which the ♂ of *C. latifrons* bears on the first abdominal segment is absent from *C. baccula*. The tibiae and tarsi of *C. baccula* are very rough with stiff bristly hair.

14. *Commista grisea* spec. nov.

♂♀. Nigra, griseo pubescens, nonnihil luteo suffusa, latitudine plus duplo longior. Rostrum porrectum latius quam longius, apice excepto late rotundatim impressum, impressione utrinque carina arcuata abbreviata contenta. Oculi laterales, fronte capitis latissima. Antennae rufae, breves, prothoracis basin paulo superantes, illis *C. latifrons* parum crassiores, segmentis 3^{io} ♂ secundo parum, ♀ vix longiore, 8° ♂ latitudine plus duplo, ♀ minus duplo longiore, 9° duobus ultimis simul sumptis atque tertio longiore. Pronotum caput versus fere

gradatim angustatum, lateribus tuberculo parvo postmediano instructum, dense ruguloso-granulatum, longitudinaliter biimpressum, carina dorsali undulata, angulo laterali valde obtusa, carina laterali obliqua medium fere attingente. Scutellum griseo-album. Elytra parallela, latitudine plus duplo longiora, striato-punctata, interspatiis alternis parum convexis, maxime tertio, ante medium depressa, gibbositate subbasali conspicua tuberculiformi, margine basali nonnihil antrorsum producta, sutura nigro-tessellata, interspatiis alternis plus minus nigro guttatis. Pedes haud hirsuti, rufescentes.

Long. 4-6 mm.

Hab. Queensland: Townsville (F. P. Dodd); a series.

The pronotum is rounded-convex at the sides of the two longitudinal depressions, and there is no depression laterally of this convex portion. The dorsal carina is concave in centre, convex close to middle, and again convex at two-thirds from middle to sides, the angle distinct though obtuse and rounded off, the lateral carina nearly straight. Abdomen of ♂ flattened in middle, without a velvety spot.

15. *Idiopus brevis* spec. nov.

♀. *I. penicillato* Jord. (1898) similis, rostro antennisque multo brevioribus, capite non-penicillato, elytris tuberculo secundo interspatii tertii mediano, pygidio latitudine longiore.

Long. 6-7, lat. 3-4 mm.

Hab. Ex-German New Guinea (v. Bennisen); two ♀♀; type in D. Ent. Mus.

Pronotum spotted with black, the dorsal carina nearly straight except that it is slightly angulate in centre, at the sides the carina curves gradually forward, being more evenly curved than in *I. penicillatus*. Rostrum only as long as apically broad, the dorso-lateral carinae obsolete and the median one vestigial. The median hump of the pronotum high. Elytra short, first and second tubercle of third interspace high, the second median, placed halfway between first and third, interspace 5 with three tubercles placed obliquely in front of those of interspace 3 and about as large as the last of 3, shoulder strongly tuberculiform, interspace 7 elevate; alternate interspaces spotted with black. Pubescence of upper surface green in fresh specimen.

16. *Gulamentus taeniatus* spec. nov.

♂♀. Niger, brevis, caput cum rostro, quinque vittis prothoracis, nonnullisque vittis elytrorum griseo-flavis, infra luteo-griseus, antennis pedibusque rufis.

Long. 4.6-6.5, lat. 2.5-3.5 mm.

Hab. Kamerun, one pair; type (♂) in D. Ent. Mus.

Middle of head brown. Pronotum densely reticulate; the yellow stripes of equal width, about half as broad as the dorsal brown-black stripes. Scutellum greyish yellow. On elytra the following greyish yellow stripes: a first beginning as a narrow line at the base at some distance from the scutellum, forming with the line of the other elytrum from before middle a sutural stripe which fades away on the apical declivity, a stripe as broad as those of the pronotum runs from base above shoulder to apex of suture where it joins a lateral stripe, which runs forward to apical two-fifths, reaching margin above second abdominal sternite, from basal third of lateral margin a short stripe obliquely up- and backwards,

a short dash below shoulder-angle, and indications of two thin lines in black dorsal stripe. Pygidium in ♂ with large brown spot, in ♀ with two small ones. Foretarsal segments 1 and 2 of ♂ quite short and broad, 3 very broad, 4 only one-fourth shorter than tibia. Claws asymmetrical, particularly in ♂, outer claw large, inner claw very much narrower and shorter, bifid. Abdomen slightly flattened in middle, last segment somewhat emarginate.

17. *Gibber frenatus* spec. nov.

♂. Close to *G. tuberculatus* Jord. (1895), somewhat narrower, the eye less elevate. Head and rostrum with a grey median line from which branches off an oblique grey line, running from the middle of the rostrum to its lateral apical angle; on occiput there are likewise two oblique lines, one on each side, these lines form a more acute angle than the oblique lines of the rostrum. Eye bounded with grey, similar in shape to the eye of *Apatenia*, not being so strongly raised posteriorly as in *G. tuberculatus*. Pronotum less convex, distinctly flattened above, with a black median tubercle, sides more strongly and evenly slanting forward, the apex of the prothorax being narrower than in *G. tuberculatus* (in conformity with the smaller width of the head); a thin grey median line interrupted by the tubercle, anteriorly an oblique dorso-lateral line likewise grey, broader, running from the apical margin not quite halfway to the carina, between its posterior end and the grey infra-lateral surface a grey spot, along the oblique line, on the dorsal side of it, a blackish, elongate patch or double band, which is somewhat accentuated at the apical margin, where it is contiguous with the grey median line, laterally between the carina and the oblique grey line some blackish patches, around the median tubercle and in front of and behind the carina luteous or ochraceous pubescence variegated with grey and interrupted by blackish, ill-defined spots, in type-specimen a faint blackish line extends from the tubercle sideways.

Elytra blackish, much variegated with pale luteous and grey, suture and alternate interspaces more or less distinctly spotted and tufted with black and grey, subbasal tubercle as high as, but shorter than, in *G. tuberculatus*; behind small median tubercle a grey line and below shoulder a grey patch. Pygidium with brown-black patch from base to beyond middle, the patch bearing a grey median line, or consisting of two ill-defined blackish stripes.

Base of femora, a large postmedian patch on tibiae, and base of first and second tarsal segments black, base and tip of tibiae and tip of claw-segment brown; claw-segment of foretarsus much longer (♂) than segments 1 to 3 together (in *G. tuberculatus* this claw-segment is much shorter than 1 to 3 together).

Hab. U. Dihing Res., Lakhimpur, Assam, x.1921 (C. F. C. Beeson); two ♂♂.

18. *Gibber callistus* spec. nov.

♂♀. In size and general appearance like *G. tuberculatus*. Head and rostrum, shoulders, flanks of underside and the greater part of the legs luteous, paler than the rest of the body. Pubescence of head and rostrum greyish luteous, with a golden sheen in parts, median line grey, distinct, thin, oblique lines absent or vestigial, middle of occiput brown; eye not so high as in *G. tuberculatus*, and the club of the antenna broader.

Prothorax as strongly truncate-conical as in *G. frenatus* spec. nov., but a little more convex, central area blackish, densely variegated with luteous grey-green, a rather ill-defined median line grey, interrupted by a blackish central tubercle, sides greyish green, carina dorsally more concave and towards the side in consequence more convex than in both *G. tuberculatus* and *G. frenatus*. Elytra grey-green, with raised dark green or blackish dots and tufts, humeral area with luteous pubescence, a basal patch in front of subbasal tubercle, an elongate, narrow, cuneate mark in middle of suture, and a transverse sutural spot or patch before apical declivity black, shoulder angle blackish, the median tubercle in third interspace smaller than in the two other described species. Pygidium with a velvety-black basal median spot.

A longitudinal lateral mark on metasternum extending on to first abdominal segment, a large patch in middle of femora (on outside), another beyond middle of tibiae and the larger portion of the first tarsal segment black, a small sub-basal spot on tibiae and their extreme tip brown. First segment of foretarsus longer than claw-segment.

Length 4 mm.

Hab. Dihing Res., Lakhimpur, Assam, vii.viii.1921 (C. F. C. Beeson); two pairs.

19. *Ormiscus micula* spec. nov.

♂♀. Pallide testaceus, griseo pubescens, brunneo variegatus, tibiis macula media brunnea. Antennarum clava compacta ovata; pronotum depressum, longitudinaliter multicarinulatum, postice reticulatum, margine laterali fere cariniformi. Sterna lateribus grosse punctata.

Long. 2-2.6 mm.

Hab. Grenada and St. Vincent (H. H. Smith); a long series in Mus. Brit.

Elytra usually with the anterior half of the sutural area and a sutural spot before apex brown, there being also some brown shadowy spots towards the sides and a larger one on centre before apical declivity, all these markings variable, the grey pubescence as a rule concentrated in the alternate interspaces as short lines or spots.

Frons in ♂ half, in ♀ two-thirds the width of the rostrum. Club of antenna barely half as long again as broad, 9 being about as long as 10 and 11 together, the three segments closely applied to each other. Prothorax broader than elytra, rotundate-angustate from base to apex, dorsally rather flat, regularly convex from side to side, with the exception of apex densely covered with longitudinal ridges, which are prominent and more or less connected with one another, forming a more regular network before carina; the sides so compressed in a vertical sense that almost an edge is formed, which runs from the carina straight forward to or beyond middle, but is not raised as a carina. Dorsal carina regularly concave, curved on to the underside at the lateral angles and not forward. Elytra with parallel sides, dorsally feebly depressed, punctate-striate, subbasal callosities and depression behind them rather indistinct. Sides of prosternum densely and very coarsely punctate, only a small space at posterior upper angle being without large punctures. In ♂ at apex of midtibia a small black ridge on inner side.

20. *Ormiscus conis* spec. nov.

♂♀. Similis *O. miculae*, pronoto leviter rugato-reticulato, prosterno area magna impunctata laterali.

Long. 1.8–2 mm.

Hab. Guadeloupe, a small series in coll. Fleutiaux and Mus. Tring, type (♀) at Tring; Martinique, one ♀ at Tring.

In colour similar to the previous; usually the sutural area from base to middle brown, here divided and extending obliquely backwards towards the sides, but often reduced to an antemedian sutural patch; two sutural spots before apex, the anterior one small and the posterior large, and the sides of elytra brown in most specimens. Sides of pronotum less compressed, less cariniform than in *O. micula*, the surface sculpture finer, consisting of an irregular network, not of longitudinal raised lines. On the underside the large punctures of the prosternum restricted to the anterior half, the posterior half bearing only a few punctures near the posterior margin.

21. *Xenocerus dacrytus* spec. nov.

♂♀. Speciei *X. lachrymans* Thoms. (1857) dictae similis, albo maculatus: capite cum rostro quadrimaculato, pronoto macula vittiformi abbreviata laterali, elytris simul sumptis octomaculatis, infra maculis lateralibus.

Hab. Philippines: Aroroy, Masbate; a series.

Segments 2 and 5 of ♂-antenna simple, 3 short. Upper- and underside blue-black, with sharply defined white markings. Pronotum without median vitta. Scutellum black. No shoulder-spot. First spot of suture near base, not reaching scutellum, second spot postmedian, smaller, somewhat transverse, at sides a spot above metasternum about as large as the first sutural one, a small spot above second abdominal segment well separated from margin, and another, round, on each elytrum before apex. Pygidium with a lateral spot, which usually is elongate. On underside two lateral spots on prosternum, one each on procoxa and meso- and metasternum; abdominal segments 1 and 2, and on segments 3 and 4 two apical spots, which on 4 are more or less completely united. Bases of mid- and hindfemora (incl. of trochanter and edge of coxa) and tarsal segments 1, 2, 4 or only of 1 also white. In small ♂♂ the antennae compressed.

22. *Xenocerus scalaris confertus* subsp. nov.

♂♀. Caput albo-griseum gutta mediana geminata nigra notatum. Elytrorum macula nigra dorsalis antemediana insulata, maculae ante apicem sitae albo-griseae diffusae.

Hab. Philippines: Aroroy, Masbate; a series.

The two black dots on the occiput usually small. Lateral whitish grey stripe of the pronotum dorsally a little dilated at a short distance in front of the carina. Antemedian black spot of elytrum between lines of punctures 1 and 4 nearly or completely isolated, at most connected by a thin black line with the spot placed obliquely behind it, this latter spot broadly joined to the limbal spot, which is connected by a thin line with the posthumeral spot; the grey markings of apical area diffuse in *X. s. confertus*, sharply defined in *X. s. scalaris*, the lateral one of them larger than in *X. s. scalaris*, usually sending forward several indistinct lines, subsutural spot absent or vestigial.

23. *Xenocerus ancyra* spec. nov.

♂♀. *X. buruano* Jord. (1898) similis, colore nigro intensiore, pronoto parum brevius et fortius punctato, fascia alba elytrorum transversa haud obliqua.

Hab. Philippines: Aroroy, Masbate; a series.

Antennal segment 3 of ♂ as long as in *X. buruanus*, *X. whiteheadi*, in large ♂♂ apical half of 10 and a subapical spot on 9, in small ♂♂ apical half of 8, entire 9, base of 10 white. Pronotum with three complete vittae, strongly punctate. Scutellum white, postmedian transverse band connected with scutellum by a sutural vitta, which is rarely interrupted at the band, oblique spot above shoulder narrow, connected (or nearly) with sutural vitta along basal margin, sometimes there is in fifth line of punctures a short subbasal line, isolated or connected with humeral spot. Pygidium with white lateral stripe, which is often reduced to two dots. Underside white, mesosternum and anal sternite more or less black medianly, metepisternum without black stripe. Legs white, apex of tibiae and of tarsal segments 1, 2 and 4 and the entire segment 3 black.

Autotropis gen. nov.

♂♀. Vicina generis *Enedreytes* Schoenh. 1839 dicti. Oculi majores et magis prominuli; antennae breviores; carinula basali laterali prothoracis dorsum versus arcuata; elytrorum margo basalis productus; scutellum antrorsum angustatum.

Genotypus: *A. modesta* spec. nov.

Head and rostrum recalling *Basitropis*, but eye separated from the antennal groove, less oblique, truncate or truncate-sinuate towards antennal groove, which is triangular; dorsal margin of this groove much less explanate than in *Basitropis*; rostrum apically more dilated than in that genus, with a small apical median sinus. Segments 1 and 2 of antenna thicker than 3, 5 to 8 shorter, in ♂ gradually increasing in thickness or at least 8 incrassate, club subcylindrical, 10 shorter than 9 and 11, broader than long. Carina of pronotum antebasal, evenly curved forward at sides without an angle being formed, not extending to middle of sides; basal carinula transverse, arched, joining the dorsal carina or remaining separate, no longitudinal carinula. Forecoxae widely apart. Hind femur not reaching apex of abdomen.

24. *Autotropis modesta modesta* subsp. nov.

♂♀. Subcylindrica, supra luteo-griseo, infra albo-griseo pubescens, elytris area laterali nigra ab humero trans medium continuata, ubi versus suturam extensa. Pronotum convexum, confertim minute ruguloso-granulatum. Elytrorum margo basalis fortiter rotundato-amplius.

Long. 2.7-3.3 mm.

Hab. Basilan (type) and Kolambugan, Mindanao; a small series.

Antennae and legs rufous, light-pubescent portions of upperside rufescent. Rostrum with median carina, like the head rugate-reticulate; in middle of frons a diffuse white spot. Eyes strongly elevate laterally. Space between eye and antennal groove as broad as segment 1 of antenna. Antenna reaching a little beyond base of pronotum in ♂, shorter in ♀, in ♂ segment 8 thicker than 7. Pronotum one-fifth broader than long, anteriorly two-thirds as wide as posteriorly,

at sides somewhat rounded in posterior half, almost evenly convex, but somewhat depressed along dorsal carina, the latter almost straight, surface structure coarser at sides and behind than in centre, apical margin smooth, more than the posterior half more or less blackish brown, at apex two convergent spots of the same dark colour close together, at sides an antemedian grey spot, in middle a thin grey line or an indication of it; the basal carinula joins the dorsal carina. Scutellum greyish white. Elytra cylindrical, almost evenly convex, a little over half as long again as broad, punctate-striate, the interspaces flat, basal margin strongly rounded, somewhat upturned, but not marginate, a \wedge -shaped mark on suture at basal fourth, and the sides from shoulder to a little beyond middle black, the streak posteriorly widened dorsad as a transverse band, which is either continuous (type) or interrupted at the suture. Pygidium semicircular. Mesosternal process truncate. Tarsal segment 1 at least half as long again as 2 + 3, 2 in median line a little longer than the tibia is broad.

25. *Autotropis modesta rugulosa* subsp. nov.

♂♀. Praecedenti simillima, pronoto sat fortiter reticulato-rugulosum.

Hab. Luzon: Mt. Banahao (type), and Mindoro: Calapan; a small series.

The lateral black stripe of the elytra is more or less suppressed, while the postmedian transverse patch or band remains.

26. *Autotropis modesta limbata* subsp. nov.

♀. Macula brunnea postscutellaris diffusa obsolescens, area elytrorum brunnea lateralis bene terminata supra ad lineam punctorum secundam aut tertiam extensa, limbo ipso plus minus griseo. Pronotum ut illud *A. m. rugulosae* reticulato-rugulosum.

Hab. Sumatra: Medan, i. and ii. (J. B. Corporaal); three ♀♀.

27. *Autotropis fraterna* spec. nov.

♀. *A. modesta* similis, rostro parum longiore, elytrorum margine basali multo minus producto, atque aliter maculata.

Hab. Perak (W. Doherty); two ♀♀.

Pronotum minutely granulate, somewhat rugulose at sides and behind, luteous grey, in middle a brown ovate patch divided behind, at each side of it (most distinct when viewed from front) a somewhat irregularly curved line, narrow anteriorly, wider posteriorly, the lines converging anteriorly. An antemedian sutural patch blackish, a smaller patch on each elytrum before apex and a stripe along apical margin rufous brown, the grey pubescence here and there less dense, the rufous brown derm showing through; basal margin but slightly rounded-produced, punctures smaller and stripes less impressed than in the previous forms. Basal carinula of pronotum not joining dorsal carina.

28. *Autotropis downingi* spec. nov.

♂♀. Antennae parum longiores quam in speciebus praecedentibus. Pronotum dorso leviter ruguloso-granulatum. Elytra brunnea, ante medium transverse depressum, gibbositate subbasali conspicua, macula magna suturali

mediana brunnea in sutura scutellum versus producta, lateribus vel ex maxima parte brunneis vel brunneo-marmorata.

Long. 3-3.5 mm.

Hab. South India: Nilgiri Hills (H. L. Andrewes and A. K. Weld Downing); one pair, type in coll. H. E. Andrewes.

29. *Basitropis papuensis* spec. nov.

♀. Clava antennarum triarticulata; abdomen immaculatum; tibiae unicolores basi brunneae, posternum punctatum, metepisternum serie punctorum parvorum instructum, metasternum lateribus sparsim sat grosse punctatum. ♂: tibia antica nonnihil arcuata, apice dente obtuso armata, postica apice inermis; abdomen medio depressum, segmento anali rotundato.

Long. 6-9 mm.

Hab. New Guinea, type from "German N.G."

Colouring of upperside as in *B. nitidicutis*, *B. affinis*, etc.; variable. Frons as broad as the rostrum is long in front of the eye, anteriorly in middle a shallow broadish groove which extends on to the rostrum. Club two and one-half times as long as broad, not villose beneath in ♂. Pronotum rounded at sides, with dispersed large punctures except at apex, which is impunctate. The prosternum distinctly punctate anteriorly, with a few smaller punctures in posterior half. Tooth at apex of foretibia of ♂ short and blunt.

30. *Basitropis epipona* spec. nov.

♂♀. Praecedenti simillima, differt antennarum clava parum angustiore, tibia maris antica apice incisa bidentata, postica calcare apicali coniformi armata.

Hab. Queensland (type) and Southern New Guinea.

The larger of the two apical teeth of the foretibia is sharply pointed, the other is short, a mere ridge, the incision or groove separating them quite distinct under a fairly high power. The spur of the hindtibia, inner side, stands nearly at right angles to the tibia. I have as yet not found any reliable difference in the ♀♀; on the whole the club of the antenna is narrower in the ♀ of *B. epipona*.

31. *Basitropis dolosa* spec. nov.

♂♀. *B. peregrino* Pasc. (1859) similis, frons antice parum angustiore, pronotum minus confertim punctato.

Hab. New Guinea, type from Friedrich-Wilhelmshafen.

As in *B. peregrina* the abdomen has a row of black lateral spots, the club of the antenna of the ♂ consists of five segments and is very hairy beneath and the tibiae of the ♂ are unarmed.

32. *Caccorhinus lateralis* spec. nov.

♂♀. Similar in structure to *C. oculatus* Sharp (1891), of which it probably is a geographical race, but elytra with a very large brown lateral area.

Varying from pale rufous to blackish brown; densely covered with a luteous grey pubescence, indistinctly variegated with whitish grey. Pronotum densely rugate-reticulate, almost smooth centrally at apex, sides darker brown, bearing blackish hairs, this brown area widest basally, where it approaches to near middle of carina, and narrowest at apex; it bears some ill-defined luteous-grey spots.

at sides somewhat rounded in posterior half, almost evenly convex, but somewhat depressed along dorsal carina, the latter almost straight, surface structure coarser at sides and behind than in centre, apical margin smooth, more than the posterior half more or less blackish brown, at apex two convergent spots of the same dark colour close together, at sides an antemedian grey spot, in middle a thin grey line or an indication of it; the basal carinula joins the dorsal carina. Scutellum greyish white. Elytra cylindrical, almost evenly convex, a little over half as long again as broad, punctate-striate, the interspaces flat, basal margin strongly rounded, somewhat upturned, but not marginate, a \wedge -shaped mark on suture at basal fourth, and the sides from shoulder to a little beyond middle black, the streak posteriorly widened dorsad as a transverse band, which is either continuous (type) or interrupted at the suture. Pygidium semicircular. Mesosternal process truncate. Tarsal segment 1 at least half as long again as 2 + 3, 2 in median line a little longer than the tibia is broad.

25. *Autotropis modesta rugulosa* subsp. nov.

♂♀. Praecedenti simillima, pronoto sat fortiter reticulato-rugulosum.

Hab. Luzon: Mt. Banahao (type), and Mindoro: Calapan; a small series.

The lateral black stripe of the elytra is more or less suppressed, while the postmedian transverse patch or band remains.

26. *Autotropis modesta limbata* subsp. nov.

♀. Macula brunnea postscutellaris diffusa obsolescens, area elytrorum brunnea lateralis bene terminata supra ad lineam punctorum secundam aut tertiam extensa, limbo ipso plus minus griseo. Pronotum ut illud *A. m. rugulosae* reticulato-rugulosum.

Hab. Sumatra: Medan, i. and ii. (J. B. Corporaal); three ♀♀.

27. *Autotropis fraterna* spec. nov.

♀. *A. modesta* similis, rostro parum longiore, elytrorum margine basali multo minus producto, atque aliter maculata.

Hab. Perak (W. Doherty); two ♀♀.

Pronotum minutely granulate, somewhat rugulose at sides and behind, luteous grey, in middle a brown ovate patch divided behind, at each side of it (most distinct when viewed from front) a somewhat irregularly curved line, narrow anteriorly, wider posteriorly, the lines converging anteriorly. An antemedian sutural patch blackish, a smaller patch on each elytrum before apex and a stripe along apical margin rufous brown, the grey pubescence here and there less dense, the rufous brown derm showing through; basal margin but slightly rounded-produced, punctures smaller and stripes less impressed than in the previous forms. Basal carinula of pronotum not joining dorsal carina.

28. *Autotropis downingi* spec. nov.

♂♀. Antennae parum longiores quam in speciebus praecedentibus. Pronotum dorso leviter ruguloso-granulatum. Elytra brunnea, ante medium transverse depressum, gibbositate subbasali conspicua, macula magna suturali

mediana brunnea in sutura scutellum versus producta, lateribus vel ex maxima parte brunneis vel brunneo-marmorata.

Long. 3-3.5 mm.

Hab. South India: Nilgiri Hills (H. L. Andrewes and A. K. Weld Downing); one pair, type in coll. H. E. Andrewes.

29. *Basitropis papuensis* spec. nov.

♀. Clava antennarum triarticulata; abdomen immaculatum; tibiae unicolores basi brunneae, posternum punctatum, metepisternum serie punctorum parvorum instructum, metasternum lateribus sparsim sat grosse punctatum. ♂: tibia antica nonnihil arcuata, apice dente obtuso armata, postica apice inermis; abdomen medio depressum, segmento anali rotundato.

Long. 6-9 mm.

Hab. New Guinea, type from "German N.G."

Colouring of upperside as in *B. nitidicutis*, *B. affinis*, etc.; variable. Frons as broad as the rostrum is long in front of the eye, anteriorly in middle a shallow broadish groove which extends on to the rostrum. Club two and one-half times as long as broad, not villose beneath in ♂. Pronotum rounded at sides, with dispersed large punctures except at apex, which is impunctate. The prosternum distinctly punctate anteriorly, with a few smaller punctures in posterior half. Tooth at apex of foretibia of ♂ short and blunt.

30. *Basitropis epipona* spec. nov.

♂♀. Praecedenti simillima, differt antennarum clava parum angustiore, tibia maris antica apice incisa bidentata, postica calcare apicali coniformi armata.

Hab. Queensland (type) and Southern New Guinea.

The larger of the two apical teeth of the foretibia is sharply pointed, the other is short, a mere ridge, the incision or groove separating them quite distinct under a fairly high power. The spur of the hindtibia, inner side, stands nearly at right angles to the tibia. I have as yet not found any reliable difference in the ♀♀; on the whole the club of the antenna is narrower in the ♀ of *B. epipona*.

31. *Basitropis dolosa* spec. nov.

♂♀. *B. peregrino* Pasc. (1859) similis, frons antice parum angustiore, pronotum minus confertim punctato.

Hab. New Guinea, type from Friedrich-Wilhelmshafen.

As in *B. peregrina* the abdomen has a row of black lateral spots, the club of the antenna of the ♂ consists of five segments and is very hairy beneath and the tibiae of the ♂ are unarmed.

32. *Caccorhinus lateralis* spec. nov.

♂♀. Similar in structure to *C. oculatus* Sharp (1891), of which it probably is a geographical race, but elytra with a very large brown lateral area.

Varying from pale rufous to blackish brown; densely covered with a luteous grey pubescence, indistinctly variegated with whitish grey. Pronotum densely rugate-reticulate, almost smooth centrally at apex, sides darker brown, bearing blackish hairs, this brown area widest basally, where it approaches to near middle of carina, and narrowest at apex; it bears some ill-defined luteous-grey spots.

Elytra as distinctly punctate as in *C. oculatus*, alternate interspaces inconspicuously tessellated with whitish grey and brown, some brown dots more distinct; a large dark brown area from shoulder to middle, narrowest anteriorly, its posterior half extended to about third line of punctures. Legs as in *C. o. formosanus* Jord. (1912), tibiae and tarsi blackish brown, usually nearly black, with a very broad median ring on the tibiae and nearly the entire first segment of the mid- and hindtarsi luteous grey.

Length 7–10 mm.

Hab. Kanara, v. 1907, in fungus (T. R. Bell); a series.

33. *Caccorhinus murinus* spec. nov.

♀. Similar to *C. obscurus* Jord. (1904), but much more elongate.

Black-brown, with a rather dispersed luteous pubescence, elytra indistinctly tessellated. Rostrum less than twice as broad as long (in *C. obscurus* rather more than twice as broad as long). Antenna dark rufous, club as long as shaft, being much longer than in *C. obscurus*, segment 3 longer than 2 and than 4, 11 nearly three times as long as broad.

Prothorax not quite one-half broader than long, densely punctate-reticulate, depressed dorsally before the carina, angle of carina a very little smaller than 90°. Elytra nearly twice as long as broad, regularly punctate-striate, depressed at the base, with the subbasal swelling distinct, but not high.

Underside pubescent greyish luteous, extreme bases and tips of tibiae and the tarsal segments 2 to 4, in foretarsus also the greater part of 1, black-brown.

Length 9 mm.

Hab. Wetter; one ♀, received from Professor G. Hauser.

34. *Caccorhinus didymus* spec. nov.

♂♀. Whereas in *C. lateripictus* Jord. (1895) the upper surface is uniformly covered by a very dense luteous grey pubescence (apart from the black lateral patch of the elytra), in the present species the pubescence of the head and thorax is ochraceous, the pronotum moreover showing numerous spots and patches of the dark brown ground. The pubescence of the elytra paler than on the pronotum, and interrupted by a number of dark brown spots, which are usually more numerous before the apical declivity; the lateral, dark brown, patch much larger than in *C. lateripictus*, extending upwards to the third line of punctures, and often bearing some grey dots. The luteous grey median ring of the tibiae larger than in *C. lateripictus*, occupying half the tibia or more.

Head and pronotum densely rugate-reticulate, only the central apical portion of the pronotum being nearly smooth. Sides of pronotum distinctly incurved in front of the basal angles, which, therefore, are more acute than in *C. lateripictus*.

Length 7–9 mm.

Hab. New South Wales, five specimens received from Messrs. Standinger. and Bang-Haas.

35. *Euparius annulipes* spec. nov.

♂♀. *E. lunato* F. (1801) subsimilis, latior. Supra omnino luteo-brunneo pubescens. Pronotum nigro marmoratum, convexum, ad carinam dorsalem

depressum, utrinque pone apicem macula alba notatum, lateribus ante carinae angulum acutum sinuatis. Elytra interstitiis alternis albo et nigro tessellata, macula alba antemediana in spatiis 3¹⁰-5° sita, gibbositate subbasali sat alta. Infra minutissime punctatus, parte antica laterali prosterni excepta. Processus mesosternalis latus, apice rotundatus, planatus. Tibiae basi medio apiceque brunneae.

Long. 6-9 mm.

Hab. Asuncion, Paraguay; a small series, type (♂) collected by Dr. J. Bohls.

On the pronotum there is an indication of a white median line at apex and behind middle, the line extending on to the occiput, and halfway to the lateral carina a small white postmedian dot in front of a black spot; the centre of the pronotum somewhat depressed. Elytra more coarsely punctate-striate and the underside much more minutely punctate than in *E. lunatus*.

36. *Apolectella corporaali* spec. nov.

♀. *A. minori* Jord. (1895) colore et statura simillima; oculis multo majoribus, antice nonnihil emarginatis; pronoto fortissime granulato-reticulato, carina dorsali recta; elytrorum interspatis tertio pone basin et pone medium paulo elevato haud tuberculato, diversa.

Hab. Sumatra: Boechs-Bander, iv. (type) and Bah-Soemboo, i. (J. B. Corporaal); two ♀♀.

A. minor also occurs on Sumatra: Soengei Merah, ix (J. B. Corporaal), one ♀.

37. *Araecorynus corismus* spec. nov.

♀. *A. subplanato* Jord. (1895) simillimus, pronoto et elytris minus deplanatis, angulo carinae prothoracicalis recto apice rotundato.

Long. 6.5-8 mm.

Hab. Fergusson I. (type, A. S. Meek) and Sattelberg, ex-German New Guinea (coll. v. Bennigsen); three ♀♀.

Elytra with a black tuft on subbasal callosity accompanied in fifth interspace by a small tuft. Foretibia without apical hook, and first foretarsal segment about twice as long as broad. In all this the new species agrees with *A. subplanatus*, described as a *Doticus*. In the latter species, however, the angle of the prothorax and that of the carina are acute, and both pronotum and elytra are more strongly depressed than in *A. corismus*.

38. *Araecorynus brachyurus* spec. nov.

♂. Ab *A. planato* Jord. (1905) pronoto lateribus fortius rotundato, pygidio longitudine latiore distinguendus.

Long. 7 mm.

Hab. British New Guinea: Mailu, vii. 1896 (Anthony); one ♂.

Third interspace of elytra carinate posteriorly as in *A. planatus*, the carina ending in a tubercle. Foretibia with a short apical hook. Angle of carina a little over 90°, lateral carina strongly curved.

39. *Araecerus arafurus* spec. nov.

♂♀. *A. vieillardii* Montr. (1860) similis, minor; abdomen grossius punctatum, segmento anali basi punctis grossis instructo; clava antennarum non symmetros; tibia antica maris ut in *A. vieillardii* mucrone longo armata. Speciminibus parvis *A. fasciculati* magis ovatus, pygidio maris tam longo quam lato, apice rotundato, feminae longitudine latiore, triangulari. Caput absque carinula mediana; coxa intermedia inermis.

Long. 2-2.8 mm.

Hab. Tenimber (W. Doherty); a series.

Midcoxa of ♂ without tooth.

40. *Araecerus omphalus* spec. nov.

♂♀. *A. vieillardii* vicinus; pronotum medio evidentius depressum, subbicallosum; caput sine carinula mediana.

Hab. Northern Moluccas: Halmaheira (type) and Ternate (W. Doherty); a small series.

In ♂ the foretibia with apical mucro and the midcoxa with tooth, as in *A. vieillardii*.

41. *Araecerus greenwoodi* spec. nov.

♂. Parvus, elongato-ovatus, rufus, luteo-griseo-pubescent, elytris parum brunneo variegatis. Oculi non-sinuati, levissime truncati. Caput sine carinula mediana. Antennarum segmentum 3^{um} quarto paulo longius, clava symmetros, 9° pyriformi decimo longiore. Pronotum conicum, medio nonnihil deplanatum, ex maxima parte subleve, lateribus brunnescentibus, punctatis, angulo basali a supero viso extus producto, angulo carinae acuto. Elytra punctato-striata, levissime granulata. Pygidium semicirculare. Processus intercoxalis mesosternalis truncatus, apicem versus paulo angustata. Metepisternum una serie punctorum grossorum notatum. Segmenta 1^{um}-4^{um} abdominis fere levia, duabus seriebus punctorum, una basali, altera apicali, instructa, hac in segmento 4° fere obsoleta, segmentum 5^{um} minute granulosum. Tibiae immaculatae, antica maris inermis.

Long. 2.8 mm.

Hab. Fiji: Lautoka, 22.viii.1920 (W. Greenwood), one ♂.

The acute angle of the pronotal carina, the almost smooth dorsal surface of the pronotum and the non-sinuate eye are the main distinguishing features of this species.

42. *Araecerus silex* spec. nov.

♂♀. *A. greenwoodi* similis. Oculi sinuati. Antennarum segmentum 3^{um} quarto aequale (♂) aut brevius (♀), clava angusta, non symmetros, 9° longitudine octavi. Pronotum fortiter reticulatum, asperum, angulo carinae subacuto. Elytra fortiter granulata, punctato-striata. Pygidium fere semicirculare. Processus mesosternalis truncato-sinuatus, apicem versus paululo angustior. Metepisternum et segmentum 4^{um} abdominis una serie punctorum grossorum, segmenta 1^{um}-3^{um} duabus seriebus instructa, segmento 3^{io} feminae tertia

serie abbreviata intermedia, 5^{um} fere leve, minutissime granulatum. Tibiae immaculatae, antica maris infra denticulata, dente apicali caeteris vix evidentiore.

Long. 2.4-2.8 mm.

Hab. New Guinea : Humboldt Bay (W. Doherty) ; one pair.

43. *Araecerus pumilus* spec. nov.

♂♀. Praecedenti simillimus. Antennarum segmentum 3^{um} quarto longius (♂) aut aequale (♀) ; clava quam illa praecedentis parum latior, non symmetros, 9^o et octavo et decimo longiore. Caput sine carinula mediana. Pronotum confertim reticulatum, angulis posticis prominulis, rufo-brunneum, in octo maculas magnas approximatas vel plus minus confluas divisum, 4 antice, 4 ante carinam ; angulus carinae subacutus. Elytra fortiter granulosa, grosse striato-punctata, macula subbasali rotundata, fascia transversa irregulari ante-mediana communi atque maculis male expressis in dimidio apicali sitis rufo-brunneis plus minus diffusis. Pygidium longitudine latius, maris fere semicirculare, feminae triangulare, acuminatum. Processus mesosternalis apicem versus angustatus, truncato-rotundatus. Metepisternum antice biseriatim punctatum. Abdominis segmenta 1^{um}-4^{um} lateribus duabus seriebus punctorum, 3^o et 4^o tertia serie incompleta. Tibiae immaculatae ; antica maris inermis.

Long. 2-2.3 mm.

Hab. Ceylon : Weligama (Dr. W. Horn) ; one ♂, three ♀♀.

44. *Araecerus bradytus* spec. nov.

♂♀. Latus, valde convexus, colore variabilis, nigro-brunneus, subtus albescens, supra luteo vel griseo pubescens, elytris sutura et lateribus nigris, aut plus minus nigris griseo guttatis, aut fere totis griseis. Rostrum inter antennas nonnihil convexum. Oculi sinuati. Caput carinula mediana instructum. Antennarum segmentum 3^{um} quarto vix longius, clava fere symmetros. Pronotum transversum, antrorsum fortissime angustatum, confertim reticulatum, lateribus ante angulos sinuatis, angulo carinae acuto apice rotundato. Elytra pone basim multo magis quam pronotum convexa, maxima altitudine pone basim,* gradatim declivia, humeris nonnihil elevatis, minute granulata, leviter striato-punctata, punctis parvis, striarum interspatiis planis. Pygidium latitudine brevius, maris apice rotundatum, feminae triangulare. Processus mesosternalis latus, rotundatus. Tibiae immaculatae, antica maris infra multidentata, sine dente apicali majore.

Long. 3.8-4.4 mm., lat. 2.3-2.6 mm.

Hab. South India: Nilgiris (A. K. Weld Downing) ; a series in coll. Andrewes.

When viewed from side almost evenly convex from head to pygidium. The elytra strongly convex behind the base, but there are no well-defined sub-basal callosities, whereas the shoulders are separated by a depression. The puncturation of the abdomen somewhat variable ; as a rule segment 1, at the sides, with a basal row and an apical one, segments 2 and 3 with a double basal row, a single apical row and a third incomplete row in middle, 4 with punctures at base, rest of sides of this segment granulate, like 5. The elytra, on superficial inspection, look almost smooth.

45. *Araecerus levipennis* spec. nov.

♂♀. *A. simulato* Gylh. (1833) similis, elytrorum striis punctatis dorsalibus obsoletis.

Hab. Philippines: Manila (type); Cochinchina; a series.

Perhaps only an extreme form of *A. simulatus*; colour of pubescence of upperside variable, sometimes (as also in *simulatus*) each elytrum with a broad luteous grey stripe. Much narrower and much less convex than *A. bradytus*.

46. *Araecerus notandus* spec. nov.

♀. Rufo-brunneus, griseo pubescens, elytris sparsim brunneo variegatis, elongatus, latitudine duplo longior. Oculi sinuati. Antennarum segmentum 3^{um} quarto dimidio longius, 4^{um}-8^{um} longitudine subaequalia, 7^{um} et 8^{um} parum latiora, clava symmetros, 9^{um} pyriforme, multo longius quam octavum, 10^{um} etiam pyriforme, brevius quam nonum. Pronotum fortiter reticulatum, sat planum, angulo carinae subacuto. Elytra pronoto plus duplo longiora, basi convexa, ante medium et pone scutellum haud depressa, confertim granulata, haud striata. Pygidium triangulare, acuminatum, longitudine parum latius. Processus mesosternalis latus, apice truncato-rotundatus. Metepisternum antice irregulariter quadriseriatim punctatum. Abdomen granulosum, segmento 1^o serie basali punctorum, caeteris segmentis impunctatis. Tibiae immacolatae.

Long. 3.2, lat. 1.6 mm.

Hab. Timor; three ♀♀.

Though the elytra are convex behind basal margin, there is no definite sub-basal callosity; the shoulders are slightly separated by a depression.

47. *Araecerus suavis* spec. nov.

♂♀. Oblongus, brunneo-rufus, supra griseo vel luteo, infra griseo pubescens, elytris plus minus brunneo variegatis, antennis pedibusque rufis, tibiis immaculatis. Caput carinula mediana instructum. Oculi sinuati. Antennarum segmenta 3^{um}-8^{um} gradatim breviora, clava symmetros, 9^{um} et octavo et decimo nonnihil longius. Pronotum grosse rugato-reticulatum, medio haud depressum, lateribus magis quam dorso convexum, angulo carinae recto apice rotundato. Elytra antice sat fortiter convexa, gradatim declivia, apicem versus leviter angustata, absque callositate subbasali, levissime striata, fere impunctata. Pygidium maris fere semicirculare, convexum, feminae paululo longius quam latius, triangulare, apice non acuminato. Processus mesosternalis latus, lateribus paulo emarginatus, apice truncato-rotundatus. Metepisternum multipunctatum. Abdomen granulosum, impunctatum, segmento primo serie basali punctorum excepto. Tibia antica maris imermis. Tarsorum anticorum segmentum secundum maris longius quam latius, feminae latius quam longius.

Long. 4-4.6, lat. 2.1-2.3 mm.

Hab. Amboina: Leitimor, Exped. Martin, xii. 1891; two pairs, ex coll. van de Poll.

Very slightly narrowing from shoulders backwards. Scutellum white. On pronotum an indication of a thin light-coloured median line. Angle of carina a very little larger than 90°.

48. *Araecerus rotundatus* spec. nov.

♂♀. Oblongus, latitudine haud duplo longior, rufo-brunneus, antennis (clava excepta) et pedibus pallide rufis, infra albo-griseo, supra luteo et griseo pubescens, elytris dorso plus minus brunneis griseo maculatis. Caput carinula media instructum. Oculi sinuati. Antennarum segmentum 3^{um} quarto longius, 4^{um}–8^{um} fere gradatim descrecentia, 9^{um} octavo multo, decimo nonnihil longius, ut 10^{um} fere symmetros. Pronotum cum capite dorso subtiliter ruguloso-reticulatum, fere leve, lateralibus evidentius reticulatum, angulo carinae obtuso, apice rotundato. Elytra antice sat fortiter sed aequaliter convexa, granulosa, striato-punctata, interspatiis vix convexis, sutura a medio versus apicem deplanata. Pygidium maris fere semicirculare, apice nonnihil convexum, feminae triangulare, acuminatum. Processus mesosternalis apice angustatus, truncato-rotundatus. Metepisternum punctis grossis antice biseriatis instructum. Abdomen impunctatum, segmenti primi serie basali punctorum excepta. Tibiae posticae leviter bimaculatae. Mas: tibia antica infra denticulata, dente apicali parum majore; coxa intermedia tuberculo sat acuto armata.

Long. 2.6–3.8 mm.

Hab. Kei Islands (H. Kühn); a long series, variable in colour and size.

49. *Araecerus cyrtus* spec. nov.

♀. Elongato-ovatus, nigro-brunneus, supra diffuse ochraceo pubescens, elytris guttulatis, antennis pedibusque brunneo-rufis. Oculi haud sinuati. Caput sine carinula longa mediana, fortiter rugato-reticulatum. Antennarum segmentum 3^{um} quarto aequale, secundo longius, nono brevius, clava angusta, symmetros, 9^{um} decimo multo longius, 10^{um} ultimo parum longius. Pronotum fortiter reticulatum, medio non depressum, angulo carinae nonnihil obtuso apice extremo rotundato. Elytra fere aequaliter et sat fortiter convexa, grosse punctato-striata et granulosa, sutura antice haud depressa, humeris paulo prominulis, sine callositate subbasali separata. Processus mesosternalis latus, apice rotundatus. Metepisternum uniseriatim punctatum. Abdomen impunctatum, segmenti primi serie punctorum basali excepta. Tibiae maculatae; tarsorum anticorum segmentum secundum latitudine longius, primum tenue.

Long. 3–3.6, lat. 1.7–2 mm.

Hab. Dutch New Guinea: Takar and Andai; two ♀♀.

Similar to *A. convexus* Jord. (1905), but easily recognised by the non-sinuate eye and the coarsely punctate-striate elytra.

50. *Araecerus corporaali* spec. nov.

♂♀. Oblongo-ellipticus, nigro-brunneus, antennis pedibusque rufis, supra pube lutea guttatus. Caput carinula mediana instructum. Oculi sinuati. Antennarum segmentum 3^{um} quarto aequilongum (♂) vel longius (♀), clava fere symmetros, 9^{um} octavo multo longius, tertio multo brevius, 10^{um} et nono et undecimo paulo brevius. Pronotum fortiter reticulatum, medio levissime deplanatum, angulo carinae obtuso. Elytra fortiter striato-punctata, granulata, convexa, suturae basi vix depressa, interspatiis alternis guttatis, paulo convexis. Pygidium latitudine baseos paululo longius, aut tam longum quam latum, maris apicem versus paulo angustatum, apice truncato-rotundatum, feminae triangulare, acuminatum. Processus mesosternalis latus, truncato-rotundatus. Metepi-

sternum antice multipunctatum. Segmenta 1^{um} et 2^{um} abdominis lateribus basi apiceque punctata, 3^{ium} multipunctatum, 4^{um} punctatum et granulatum; mas: abdomen medio late depressum, segmentum anale concavum, apice truncatum, angulis tumidis. Tibiae immaculatae, antica maris denticulata, apice dente sat longo armata.

Long. 3-3.8, lat. 1.6-1.9 mm.

Hab. Sumatra: Siantar (type), and Java: Preanger (J. B. Corporaal); a series of both sexes.

The ♂ is easy to recognise by the strong depression on the abdomen and the truncate anal sternite; the long pygidium the ♂ shares with *A. suturalis* Boh. (1839). In both sexes the light pubescent portions of the upperside have the derm rufescent; the apex of the pronotum, a patch behind the scutellum and another above shoulder, as well as the head, are of the same colour as the dots of the elytra. The puncturation of the abdomen varies to some extent, segments 1 and 2 often bearing several punctures in middle of side.

51. *Araecerus mordellinus* spec. nov.

♀. Longus, latitudine plus duplo longior, rufus, griseo pubescens, fere unicolor. Caput carinula mediana instructum. Oculi sinuati. Antennarum segmentum 3^{ium} quarta longius, 4^{um}-8^{um} descrescentia, clava fere symmetros, 9^{um} atque 10^{um} longitudine tertii. Pronotum supra paulo convexum, medio haud depressum, sat fortiter reticulatum, angulo carinae acuto. Elytra pronoto plus duplo longiora, modice convexa, granulata, punctato-striata, interspatiis planis. Pygidium triangulare, latitudine parum longius. Processus mesosternalis latus, apicem versus angustatus, truncato-rotundatus. Metepisternum multipunctatum. Abdomen lateribus punctatum: segmenta 1^{um}-3^{ium} basi apiceque, 3^{ium} etiam in medio, 4^{um} basi. Tibiae immaculatae; tarsi antici segmentum secundum latitudine apicali non longius.

Long. 3.1, lat. 1.5 mm.

Hab. Java: Mt. Arjoeno, 7-9,000 ft., i. 1896 (W. Doherty); one ♀.

Besides the basal and apical punctures there are on the second abdominal segment also a few punctures in the middle at some distance from the lateral margin, on the third segment these intermediate punctures are fairly numerous.

52. *Araecerus nitidus* spec. nov.

♂. Longus, parvus, subcylindricus, rufo-brunneus, griseo-pubescent. Caput sine carinula mediana. Oculi non sinuati. Antennarum sat longarum segmentum 3^{ium} quarto parum, nono multo longius, clava symmetros, segmentis fere aequilongis, 9° et 10° pyriformibus octavo vix longioribus. Pronotum confertim reticulatum, area media magna brunnea postice plus minus quadrifida, angulo carinae acuto, carina laterali brevi. Scutellum griseo-album. Elytra ad apicem usque fortiter striato-punctata, granulata, brunneo irregulariter marmorata. Pygidium latitudine longius, lateribus rectis, apicem versus parum angustatum, rotundato-truncatum, angulis rotundatis, fere glabrum, basi medio impressa. Processus mesosternalis angustus, rotundato-truncatus. Metepisternum irregulariter biserialiter punctatum. Segmenta abdominalia 1^{um}-3^{ium} basi apiceque, 4^{um} et 5^{um} basi serie punctorum instructa, 4^{um} et 5^{um} non evidenter granulata, 1^{um}-5^{um} medio depresso-planata, segmento anali truncato.

Pedes pallide rufi, genibus et tibiis fere dimidio apicali nigro-brunneis; tibia antica inermis; segmentum 2^{um} tarsi antici latitudine apicali longius.

Long. 2.2, lat. 1.2 mm.

Hab. Fiji: Nansori, v. 1921 (type) and Labasa, xii. 1921 (R. Veitch); two ♂♂.

The abdomen almost being polished, the punctures are very conspicuous; on segments 1 to 3 the rows, or at least the basal one, extend from side to side.

53. *Deropygus didymus* spec. nov.

♂♀. *D. haemorrhoidali* Jord. (1895) similis, angulo carinae prothoracalis minus obtuso, carina laterali magis biflexuosa. ♂ pygidio apice inciso utrinque fossa parva elongata instructo; ♀ antennarum clava brevior, pygidio longiore angustiore, tuberculo magis elevato.

Hab. Perak (type), also from Sumatra, Java, the Philippines and Formosa.

The pygidium of the ♂ bears in *D. haemorrhoidalis* a number of raised lines in apical third, which are absent from the new species. The small elongate subapical lateral groove on the pygidium of *D. didymus* has its dorsal margin raised; the median carina is distinct at apex; the median groove of the propygidium is not distinctly continued on to the pygidium (♂♀) and not defined at the base of the latter by raised margins.

54. *Deropygus truncatus* spec. nov.

♂♀. Parvus, rufus, paululo brunneo variegatus, supra griseo-albo maculatus; pygidio (♂) apice truncato bisinuato, (♀) brevi, carina subapicali transversa recta flabello lato instructa.

Long. 2.4 mm.

Hab. Borneo; one pair.

Similar to *D. maculatus* Jord. (1895), but midfemur without tooth, and pygidium quite different. Head, apex and sides of pronotum and three spots before the carina, numerous short lines on the elytra, a small round antemedian sutural spot and a large postmedian one (concave in front, round behind) and the greater part of the declivous apex greyish white. Eyes almost touching each other in ♂, in ♀ the frons a little narrower than the fourth segment of the antenna is long. Angle of carina of pronotum obtuse, lateral carina reaching to middle.

Anal segment: in ♂ the pygidium not quite twice as long as broad, convex along middle, but not carinate, slightly narrowing from base to apex, the latter truncate, with the margin rounded in middle and somewhat incurved at sides; abdomen constricted, segment 3 medianly below the level of the previous ones, anal sternite vertical, with the angles slightly incrassate and without stiff tawny bristles. In ♀ the pygidium broader than long, the basal area bounded by the subapical transverse carina is a transverse oblong, but somewhat broader at base and the sides slightly rounded, the subapical flap broader than long, emarginate in middle.

55. *Deropygus simplex* spec. nov.

♂♀. *D. anali* Jord. (1895) similis, minor, carina laterali prothoracis longiore, segmento anali ventrali (♂) multo brevior, haud barbato, pygidio (♀) triangulari, latitudine longiore, medio paululo convexo, carina transversa subapicali lacinia tenuissima instructa.

Long. 2.5 mm.

Hab. Perak, one ♂, type; Borneo, one ♀.

Pygidium of ♂ as in *D. analis*, but shorter, slightly swollen in middle from near base to beyond centre, here the swelling expanding sideways, at apex again a slight median swelling; sternites 1 to 4 on a level, 5 simple, neither truncate nor sinuate, medianly not longer than 2 to 4 together, vertical, without stiff tawny brush, but with indication of a median carina; lateral flap of genital organs not widened, quite narrow, linear. In ♀ the pygidium triangular, distinctly longer than broad, with a median swelling near base, before apex a transverse carina, short, complete, faintly angulate in middle, bearing a very narrow linear flap. Midfemur as in *D. analis* without tooth.

56. *Deropygus elegans* spec. nov.

♂. Niger, albo-griseo variegatus, pedibus ex parte rufis, elytris fascia post-mediana irregulari transversa versus latera abbreviata ornatis; pygidio lateribus fere parallelis, apice truncato-emarginato, segmento anali ventrali lato, emarginato-truncato, barbato.

Long. 3.4, lat 1.4 mm.

Hab. Luzon: Mt. Data; one ♂.

Frons about as broad as the third segment of antenna is long. Club broader than usually, the three segments equal in length, each longer than segment 4. Pronotum distinctly depressed in front of carina at each side; dorsal carina very slightly concave medianly, almost straight, angle obtuse, only its extreme tip rounded, indications of a few white spots and of a thin median stripe. Elytra long, nearly twice as long as broad, transversely depressed before middle, with distinct subbasal callosity, interspaces more or less convex, suture from before middle to apex higher than the other interspaces; postmedian white band trisinate behind, less deeply sinuate in front, narrowing laterally, almost reaching a diffuse median lateral spot, at beginning of apical declivity some small spots placed in a transverse row, at apex and at base other small spots and diffuse white pubescence. Pygidium only half as long again as broad, hardly at all narrower at apex than at base, very feebly convex in middle, flattened at apex, apical margin incurved, angles rounded and somewhat upturned. Abdominal sternites 1 to 4 practically on a level, 5 slanting, the ventral outline of the abdomen in a lateral aspect being gently and almost evenly curved, 5 broad, emarginate-truncate, somewhat flattened in middle, with a row of stiff tawny bristles each side. Fore- and midlegs pale testaceous, first foretarsal segment as long as 2 and 3 together; hindleg brown-black, middle of tibia rufescent, apex of tarsus pale testaceous.

Colour and markings probably variable.

57. *Deropygus gracilis* spec. nov.

♂. Cylindricus, brunneo-niger, capite, pronoti apice, pedibus quatuor anticis atque genibus posticorum rufis, albo variegatus. Oculi prominuli, valde transversi. Caput cum rostro album. Pronotum apice et lateribus et tribus guttis dorsalibus albis, angulo carinae rotundato, carina laterali arcuata trans medium continuata. Elytra cylindrica, dispersim albo lineolata. Pygidium parallelum, medio carinatum, paululo caput versus inclinans.

Long. 2.7 mm.

Hab. Philippines: Basilan; one ♂.

Head and rostrum, apex and sides of pronotum as well as three dorsal spots, a line along dorsal carina and dispersed linear spots on the elytra white, the white apical border of the pronotum posteriorly quadrisinuate, no spot across suture, the most distinct markings of the elytra are : at base two patches, before middle a spot close to suture and several between stripe 5 and side-margin, at beginning of apical declivity a confluent double spot between interspaces 2 and 5 and another composed of three lines between 6 and 9, lateral margin, except basal fourth, and apex bordered with white.

Eye transverse, half as long again as broad, rather strongly convex laterally. Frons as broad as segments 3 + 4 of antenna are long. Segment 4 of antenna = 5 = 6, longer than 3, 7 = 8 = 3, club nearly symmetrical, fairly broad, not quite so long as 5 to 8 together, 9 = 10 = 11 = 11 elliptical, twice as long as broad. Pygidium vertical, half as long again as broad, sides straight, elevate, apex truncate, with the angles rounded, medianly somewhat depressed, median carina rather sharp, fading away at extreme base. Ventral outline of abdomen gently curved (side-view), 1 to 4 almost on a level, 5 slanting, truncate, medianly somewhat flattened, apical margin incrassate, with an uninterrupted close-set row of short stout tawny bristles resembling a comb and directed downwards.

58. *Deropygus spilosus* spec. nov.

♂♀. Rufus, albo maculatus, pygidio maris longo, gradatim angustato, apice rotundato, parum antrorsum inclinante, feminae triangulari, tuberculo alto mediano cristiformi instructo, segmento anali ventrali maris angusto barbato, femore intermedio inermi.

Long. 3 mm.

Hab. Perak (W. Doherty) ; one ♂, two ♀♀.

On pronotum three separate brown patches in ♂, confluent in ♀, in between them two white patches connected with the white border of the dorsal carina, sides and apical margin white. Spots of elytra well-defined, besides a ring around subbasal swelling and a spot behind shoulder each elytrum with eight spots : before middle an elongate spot at suture, in middle a spot between interspaces 3 and 5 and another at side, behind middle a square one at suture and a little further forward a small one between interspaces 5 and 7, at apical declivity one between 2 and 4 and another at side, and a spot at apex, at side a line connecting the marginal spots.

Eyes as close together as in *D. maculatus*, from which the present species is easily distinguished by the unarmed midfemora. Club of antenna long, narrow, asymmetrical. Dorsal carina of pronotum incurved in centre, lateral angle obtuse, lateral carina curved, reaching a little beyond middle. Pygidium and anal sternite bent forward, but not much, the sternite forming an angle of about 80° with segments 1 to 4, which are on a level, whereas in *D. maculatus*-♂ the anal sternite is almost horizontal, 2 to 4 in that species being centrally reduced to very narrow strips; pygidium of *D. spilosus*-♂ long, with rounded apex, centre somewhat swollen, but there is no distinct carina. Pygidium of ♀ with a rough tubercle from base to middle, where it terminates abruptly, the groove of the propygidium extends on to this cariniform tubercle; beyond middle an uninterrupted transverse ridge forming an angle, the apex of which is directed backwards. Sides of prosternum with a large dark brown patch, in ♂ also the abdomen dark brown,

59. *Deropygus arcus* spec. nov.

♂. *D. spiloso* colore simillimus, minor, abdomine fortissime constricto-excavato valde diversus.

Long. 2 mm.

Hab. Luzon: Imugan; one ♂.

On the upperside the specimen almost looks as if it were a small specimen of *D. spilosus*, but the postmedian spots of the elytra are connected with one another, a transverse band being formed which is bent back at the suture and forward on each elytrum at stripes 4, 5. Pygidium vertical, narrow, twice as long as basally broad, gradually narrowed, apex rounded, centre slightly convex. Abdomen very deeply constricted-excavate, in a lateral view looking like an arch with vertical sides, the frontal side being formed by sternites 1 and 2, the top of the arch by 3, and the posterior side by 4 and 5, 5 rather thick in lateral aspect, the ventral surface apically slanting anad, apex with stiff tawny bristles.

60. *Deropygus acutus* spec. nov.

♂. *D. haemorrhoidalis* colore et statura simillimus, angulo carinae prothoracicalis acuto, processu intercoxali mesosternali triangulari acuto, pygidio latiore, segmento anali ventrali brevior, segmento primo tarsi antici longior.

Long. 3.8 mm.

Hab. Aru (Wallace); one ♂.

Head and thorax rufo-testaceous spotted with black-brown. Disc of pronotum black-brown, apex and sides spotted with greyish white; lateral carina evenly rounded, fading away beyond middle, dorsal carina laterally more strongly convex than usually, the angle being smaller than 90°. Elytra cylindrical, longer and somewhat flatter than in *D. haemorrhoidalis*, the lines of punctures greyish white, behind middle a cluster of small spots in first three stripes, and apical declivity also greyish white, the declivity rufescent, abrupt, short and steep, with the third interspace cariniform. Pygidium a little inclining forward, about half as long again as broad (8:5), somewhat convex in centre, flat at apex, which is truncate, sides gradually converging apicad, slightly rounded in middle. Anal sternite less modified than usually, short, slanting anad, forming a very obtuse angle with 1 to 4, which are on a level with each other. Intercoxal process of mesosternum not tuberculiform, but flat, triangular, slanting. Foretarsal segment 1 as long as 2 and 3 together. Rostrum, a large oblique lateral spot on prosternum and nearly the whole meso-metasterna and abdomen blackish.

61. *Deropygus hercules* spec. nov.

♂. *D. acuti* vicinus, major, pygidio truncato-sinuato angulis productis, coxis intermediis crista brevi bituberculata armatis, metasterno medio subconcavo postice linea media elevata instructo, segmento anali truncato apice fimbriato.

Long. 5, lat. 2.2 mm.

The largest known species. Colouring more or less as in *D. haemorrhoidalis*. On pronotum from carina forward a black median patch which is anteriorly excised; carina as in *D. acutus*, angle acute. Elytra somewhat depressed transversely before middle, black, the stripes of punctures grey, apex rufescent, with a grey pubescence, a minute grey spot each at suture before middle and at the beginning of the apical declivity, in second stripe behind middle, and in third in

middle, also a few dots at the sides. Pygidium rather strongly inclining forward, more than twice as long as basally broad (20:9), with median carina, apex-truncate emarginate, the angles projecting somewhat sideways, from tip to tip two-thirds as wide as at base. Mesosternal process narrow, slanting, triangular, acute. Middle of metasternum broadly flattened as usual, the sides of this area elevated posteriorly into a broad tuberculiform swelling, median line with a small tubercle behind middle. Anal sternite quite short (i.e. its median portion), its base slanting backwards, the apical margin, which is sinuate in centre, bent forward and bearing an uninterrupted comb of flat, tawny bristles. Foretarsal segment 1 short. As in *D. acutus* femora and tibiae more or less black at base and apex.

61. ***Deropygus giton*** spec. nov.

♂. A *D. haemorrhoidali* pygidio et segmento anali ventrali brevioribus distinguendus.

Hab. Perak; two ♂♂.

Pygidium less than twice as long as basally broad (9:5), and without raised lines in apical area. Anal sternite short, shorter in middle than 2 to 4 together, slightly slanting backwards, convex along middle, with soft long hair at apex, but without stiff tawny bristles, apical margin slightly angulate each side, rounded centrally.

62. ***Melanopscacus funebris*** spec. nov.

♂♀. *M. atrato* Jord. (1924) statura similis, parum latior, prosterno area impunctata nitida basali laterali, segmentis 1° et 2° abdominalibus minutissime punctatis duabus vel tribus seriebus punctorum grossorum instructis; segmento ventrali anali feminae sinuato.

Hab. Luzon: Limai; a series.

The first abdominal segment has at the side two rows of large punctures, one basal, the other subapical, on the second segment there is an additional, variable, intermediate row which does not reach the lateral margin. In this sparse puncturation the new species differs from *M. atratus*, *M. subglaber*, *M. gravatus*, etc.; from *M. atratus* also by the presence of a smooth basal lateral space on the prosternum. Above the forecoxa a smooth vertical line, between this line and the basal margin five or six rows of large punctures close together. Angle of pronotal carina 90°. Base of prothorax and elytra a little broader than in *M. atratus*, sides of prothorax more oblique. The small round apical sinus of the anal sternite the ♀ shares with several other species, but differs therein from *M. gravatus*.

ON SOME GENERA OF ANTHRIBIDAE ALLIED TO *EXILLIS* PASC.(1860)

By DR. KARL JORDAN.

AMONG the *Anthribidae* which Mons. E. Fleutiaux has very kindly submitted to me for study there was a most interesting set of specimens from New Caledonia. Some of the undescribed species had labels with names given to them in manuscript by Fauvel; the same unpublished names were also in our collection, and I have here adopted them as far as possible.

I. *Dinema* Fairm. (1849).

♂♀. Rostrum and frons vertical, forming an angle with occiput; the rostrum somewhat inclining backward, much longer than broad, subcylindrical at base, widest at apex, apical margin very feebly incurved in middle. Antenna long in both sexes, inserted in sinus of eye, the scrobe covered by a tuberculiform lobe on the inner (frontal) side, segment 1 long, claviform, 2 short, 3 to 8 thin, long, 9 slightly but distinctly widened apically, 10 and 11 each shorter and broader than 9. Eye reniform, deeply incurved, the upper lobes approaching each other, the interspace being about one-fourth the width of the rostrum (the latter measured at its narrowest point). Prothorax very much broader than long; carina antebasal, extending forward to apex, angle rounded.

One species: *D. filicornis* Fairm. (1849), from Tahiti. In Mus. Tring one bad ♀.

II. *Proscopus* gen. nov.

♂♀. Rostrum vertical, much shorter than in *Dinema*, flatter, not subcylindrical at base, with a sharp carina running from marginal (frontal) tubercle of antennal groove down to apex of rostrum. Upper lobe of eye strongly reduced, the sinus vestigial, the eye being placed entirely behind the antennal scrobe, not curving round it dorsally. Antenna and pronotum essentially as in *Dinema*.

The head recalls that of *Thrips* or some long-faced Lamiine Longicorn.

One species:

1. *Proscopus veitchi* spec. nov.

♂♀. Rufo-brunneus vel pallide testaceus, hic et inde nigrescens, antennarum basi pedibusque pallidis, pronoto paulo convexo, subtrivittato, lateribus rotundatis, elytris fortiter punctato-striatis.

Long. (cap. exc.) 2-2.8 mm.

Hab. Fiji: Labasa, xii. 21, 1 ♂, type, and Cuva, xi. 21, 1 ♀ (A. Veitch); Lautoka, vii. 21, 1 ♀ (W. Greenwood).

In centre of pronotum the grey pubescence very scattered, an oblong area from apex to base appearing brown, divided by a more or less conspicuous grey median line; at each side of this area the grey pubescence concentrated, forming an oblique longitudinal stripe which curves towards the anterior lateral angle, but ends above it. Suture and sides of elytra more or less blackish or brown.

Frons and rostrum in a lateral view concave. Side of rostrum slanting from dorso-lateral carina, the sides somewhat expanding; carinae diverging, the rostrum gradually widening apically, being at the widest point (in ♂) three-fifths or (in ♀) fully as broad as rostrum and frons together are long (mandibles excl.), apical margin convex, slightly depressed in middle, not emarginate. Antennae longer than body, much longer in ♂ than in ♀; segment 1 subcylindrical, apart from narrow base, not claviform, about one-third shorter than its distance from base of mandible, 2 half 1, 3 about 1 + 2, in ♂ 3 to 6 nearly alike, 7 a little shorter, 7 to 9 perceptibly decreasing in length, in both sexes 9 about as long as 1 and a little longer than 1!, which is slightly longer than 10.

Pronotum one-fourth broader than long, a little wider at apex than at base, with the sides rounded, disc transversely depressed before middle and along dorsal carina; basal area and sides punctate, but the punctures very shallow, more like depressions of the surface; carina curved forward to apex, without distinct subbasal angle.

Elytra not quite twice as long as broad, with the sides parallel as far as apical declivity, which is evenly convex; stripes and punctures deep; alternate interspaces with brown or blackish dots, which are more or less confluent with the sutural and lateral blackish areas in ♂. Pygidium broader than long, strongly rounded at apex.

Underside as in *Dinema* with shallow depressions which look like large punctures, but are hardly at all sunk into the derm.

III. *Proscoporhinus* Montr. (1860).

♂♀. Rostrum vertical, quinque-carinate, median carina feeble, sinus of apical margin very sharply defined, apical width of rostrum about equalling its length measured from lateral apical angle to the tubercle which covers the antennal groove. Segment 1 of antenna long, claviform, 2 short. Upper lobe of eye broader than lower. Lateral carina of pronotum reaching to about middle, not to apex. ♂♂ with transverse crest of hairs between eyes.

Genotype: *P. amyoti* Montr. (1860).

1. *Proscoporhinus apicatus* spec. nov.

♂♀. Rufo-brunneus, albo-griseo et luteo pubescens, brunneo variegatus, elytris subtessellatis. Occiput (♂) duobus penicillis nigris instructum. Pronotum ante carinam biimpressum. Elytra tuberculata.

Long. 3 mm.

Three ♂♂, one ♀ from Forêt de Mont Dore, N. Calédonie, in coll. Fleutiaux, one of the ♂♂ kindly presented to the Tring Museum.

Pubescence much more uniform in colour and purer white beneath than above, where a great portion of it has a yellowish tone; apex of antenna, the tubercles and elevated dots of the elytra, some sutural spots, particularly a sub-apical one, brown. Head very much less widened than in *P. amyoti* Montr. (1860): Rostrum longer than broad, slightly widened at apex, the side being nearly parallel, its upper surface impressed in middle. Frons in ♂ rather more than one-third and in ♀ one-half the width of the rostrum; in ♂ the occiput bears between the eyes a transverse crest of blackish hair, the crest divided in middle. Pronotum nearly twice as broad as long, punctate-rugate, disc flattened,

with two rather large but shallow depressions before the carina, one at each side of middle, sides brownish; dorsal carina obtusely angulate in middle, somewhat convex towards sides.

Scutellum grey, a little longer than broad. Elytra coarsely punctate-striate, sides parallel, subbasal callosity and an antepical elevation between third and sixth stripes tuberculiform, rather large; behind subbasal callosity a depression, which does not affect the suture; behind it in interspace 3 a small tubercle and another farther back, similar small tubercles in 5 and 7; in middle of interspace 9 of ♂ a small tuft of pale pubescence surrounded by a naked ellipse as in *Anthribisomus tessellatus*-♂; sutural area in between the posterior tubercles depressed, flattened.

Underside with large punctures. Anal segment of ♂ with median groove. Antenna of ♂ longer than the body, segment 1 more than twice as broad in apical half than in basal half, 2 claviform, half as long again as broad, 3 a little longer than 4, 4 to 6 nearly equal, 7 to 9 decreasing slightly; in ♀ antenna not reaching apex of elytra, segment 1 less broad than in ♂, 3 more distinctly longer than 4; in both sexes 9 about as long as 8, apically as wide as 10, 10 as long as broad in ♂, slightly broader in ♀, 11 ovate-acuminate, a little longer than broad.

IV. *Anthribisomus* Perroud (1866).

♂♀. Rostrum much broader than long and like the frons flattened, often with broad shallow depression, always more or less vertical or at least not in a plane with occiput, no median sulcus. Antenna long, segment 1 thick, cylindrical (apart from extreme base) or subglobular, 2 claviform, 3 to 8 thin long. Carina of prothorax extending forward to middle of side.

Genotype: *A. tessellatus* Perroud (1866).

Besides the type and the three species described below, all from New Caledonia, we place here also the species from New Zealand with the eyes sinuate, lateral, the rostrum more or less directed downward, without median sulcus, and the antennae long, with a thick first segment, etc. The above definition of *Anthribisomus* is wide enough to cover a variety of forms.

1. *Anthribisomus tessellatus* Perroud (1864).

Frons and rostrum vertical, grey, the latter strongly angulate at the sides in ♂, less angulate in ♀. Elytra usually with a brown median patch across suture, the patch more or less continued backward in centre of each elytrum, most specimens with ill-defined brown markings in apical half. In ♂ a conspicuous spot of grey pubescence in middle of side of elytrum, encircled by an elevated naked ring; this sex-mark not present in the other species of the genus.

A long series of both sexes from Nouméa (Delauney).

2. *Anthribisomus maculatus* spec. nov.

♂♀. Rostro brevius lateribus haud angulato, prothorace magis rotundato dorso ante medium multo magis convexo, elytris (♂) absque gutta grisea laterali.

Long. (cap. excl.) 1.9–2.3 mm.

Rostrum shorter than in *A. tessellatus*, its base impressed, the sides not widened out below the antennal grooves. Pronotum much more strongly punctate, strongly convex transversely before middle, the sides rounded, the

prothorax being widest before middle, not at angle of carina. Elytra very coarsely punctate-striate, cylindrical, with distinct subbasal swelling.

Rufous, pubescent grey, usually variegated with brown on the elytra, rarely unicolorous: in type (and several other specimens) the subbasal callosity, the greater part of the suture, several lateral spots merged together into a large patch, and on each elytrum a patch before apex brown; in other specimens only a large median lateral patch, the patches sometimes joined across suture.

A series from Nouméa (Delauney); type in coll. Fleutiaux.

3. *Anthribisomus corticeus* spec. nov.

♂♀. *A. maculato* similis, prothorace antrorsum angustato, dorso multo minus convexo, elytris postice parum dilatatis distinguendus.

Sculpture of derm of prothorax and elytra as coarse as in *A. maculatus*. Prothorax slightly rounded at the sides, being widest before base at the angles of the carina; pronotum slightly convex before middle, much less elevate than in *A. maculatus*. Elytra less cylindrical, being slightly widened and dorsally swollen from middle, the basal fourth appearing depressed.

Colouring as in *A. maculatus*; on pronotum the grey pubescence somewhat concentrated along centre and sparser at each side of this diffuse stripe. On elytra usually a spot on subbasal callosities, a transverse median band across suture curved forward at sides, and on each elytrum a transverse subapical patch, brown, all variable, often part of the suture also brown; in front of the brown median band the third and fifth interspaces with an almost white line.

A series from Nouméa (Delauney).

4. *Anthribisomus xylophagus* spec. nov.

♂♀. Squamosus; segmento 3io antennarum quarto longiore; prothorace antrorsum ampliato, carina ad lateris medium extensa; elytris cristatis.

Long. 1.7-2.7 mm.

Differs from all the other species in being clothed with elongate scales which, on the elytra, are directed obliquely backwards and upwards towards the centres of the interspaces of the stripes of punctures, this scaling cream colour variegated with brown, forming on pronotum a median stripe before carina and a lateral spot at apex. Rostrum transversely impressed close to apex, sides angulate immediately before antennal grooves, but the angle not projecting much. Antennal groove a little farther away from eye than in the previous species, both ends of the eye being above the groove, the posterior end not extending down below to the level of the upper margin of the groove as is the case in the other species. Segment 1 of antenna quite short, thick, almost globular (apart from extreme base and anterior excision), 2 about one and a half times or twice as long as apically broad, claviform, 3 longer than 4. Pronotum strongly impressed before carina in middle, the sides widening apicad, the apical margin rather strongly projecting over the occiput, puncturation coarse, lateral carina longer than in the three preceding species, reaching to middle. Elytra very coarsely punctate-striate, the interspaces raised, the alternate ones cariniform, especially 3 and 5, striped or spotted with white, in middle of 3 and at beginning of apical declivity in 3 and 5 a brown crest, from middle of 3 obliquely forward to side brown markings or a large brown patch. Tibiae with brown postmedian spot.

A long series from Nouméa (Delauney).

V. Euciodes Pasc. (1866).

♂♀. Long, cylindrical. Eye forming nearly two-thirds of a ring, almost even in width from end to end, the sinus very deep. Antennal segments 3 to 8 not thinner than 2. Lateral carina of prothorax quite short, a mere hook to the dorsal carina. Base of elytra evenly incurved from shoulder to shoulder.

One species: *E. suturalis* Pasc., from S. Australia.

VI. Arecopais Brown (1893).

♂♀. Similar to *Anthribisomus*, rostrum with medium sulcus between the antennae, upper lobe of eyes narrow, much smaller than lower lobe.

Genotype: *A. spectabilis* Brown (1880).

The median furrow of the rostrum is the result of the surface being raised between the antennae (in one species as a couple of tubercles) except in the middle line.

VII. Exillis Pasc. (1860).

♂♀. Rostrum short, with a short deep median groove. First foretarsal segment longer than in all the previous genera, being longer than half the foretibia.

Genotype: *E. longicornis* Pasc. (1860).

THE BIRDS OF ST. MATTHIAS ISLAND

By ERNST HARTERT.

NORTH and a little to the west of New Hanover lies, between $1^{\circ} 17'$ and $1^{\circ} 32'$ southern latitude, and between $149^{\circ} 30'$ and $149^{\circ} 46'$ eastern longitude, the island of St. Matthias or Mussau, also called Prince-William-Henry Island. The island consists of a plateau, partly covered with thick forest, here and there grassland with bushes and *Pandanus*, and elevated coralline formation, surrounded by a sandy beach with coconut palms and native villages; the whole is encircled by a double ring of narrow coral-reefs. The natives are among the worst of these islands.

Only once an ornithologist landed on the island: Dr. O. Heinroth, then a member of the "German South Sea Expedition by Br. Mencke," landed there March 29th, and two days after the camp was treacherously attacked, Mr. Mencke and his friend Caro were killed, Dr. Heinroth was wounded and lost some skins and note-books. In spite of this disaster, which brought the explorations to an untimely end, Dr. Heinroth succeeded in discovering and bringing home the most striking, peculiar birds of St. Matthias Island, viz. *Halcyon matthiae*, *Monarcha menckei*, and *Rhipidura matthiae*. These birds were described and figured in *Journ. f. Orn.* 1902. Since then no collector of birds has visited St. Matthias, except Dr. Duncker during his researches on marine zoology, who shot an *Orthorhamphus* (rectius *Esacus*) *magnirostris*.

It was therefore Lord Rothschild's desire to have a good collection from the island, and at last A. F. Eichhorn sent a fine collection of 38 species, all beautifully prepared skins. Unfortunately the blackbird and several others were only obtained in single specimens, but we are very thankful for what we have received from this out-of-the-way island, where collecting is perhaps even now a risky undertaking.

Through Eichhorn's collecting we know now 39 species of birds to inhabit St. Matthias. It is peculiar that no *Zosterops* was found, and I am inclined to think that it must exist, and might have been overlooked. It is also peculiar that no Owls, no *Corvus*, no *Cisticola* were found; on the other hand the discovery of such unexpected species as *Phylloscopus* and two kinds of *Turdus* is of the greatest interest. Even if a land-bird or two have been overlooked, the number of resident species will probably not be greatly enlarged, while doubtless a number of other shore-birds, migrants from the north, will occur on the shores during the winter months, but they will not alter the zoogeographical aspect of the island.

Zoogeographically St. Matthias is obviously nearest to New Hanover (antea, pp. 194-213), but there is a very interesting affinity in certain cases to the Admiralty Islands or Manus: *Micropsitta meeki proxima* is very close to *M. meeki meeki* from Manus, the still doubtful form of *Edolisoma morio* (No. 31) is very much like *E. morio admiralitatis*, and the *Pachycephala* (No. 35) is, it seems to me, nearest to *goodsoni* from Manus. The number of peculiar forms is great: 3 were discovered by Heinroth, 7 were described by Lord Rothschild and myself

in *Bull. B.O. Club*, xliv. pp. 50-53 (1924), and in the following pages I have named again 7 new forms, so that 17 forms are now known only to occur on St. Matthias, and at least two others could so far not finally be determined, for want of series.

The literature on St. Matthias Island is thus small:

1902: O. Heinroth, "Ornithol. Ergebnisse der I. Deutschen Südsee-Expedition von Br. Mencke," in *Journ. f. Orn.* 1902.

1922: G. H. Martens, "Vög. der Südsee-Expedition der Hamburger Wissenschaftl. Stiftung 1908-1909," in *Archiv. f. Naturg.* 1922 A, Heft 6 (edited by Duncker, after Martens' death).

1924: Rothschild and Hartert, description of 7 new birds from St. Matthias Island, in *Bull. B.O. Club*, xliv. pp. 50-53.

1. *Tringa hypoleucos* L.

18. 20. 27.vii.1923. Also Squally Island.

2. *Charadrius dominicus fulvus* Gm.

♀. 14.vii.1923.

3. *Esacus magnivostris* (Vieill.).¹

A specimen was shot on the shore of St. Matthias Island 10.ix.1908 by Dr. Duncker (*Archiv. f. Naturg.* 1922, Heft 7, p. 52).

(I see no reason for separating "*Orthorhamphus*" from *Esacus*, the more upturned bill of the latter being a good specific character, but it is needless to separate the two genera.)

4. *Eulabeornis tricolor tricolor* (?).

Rallina tricolor Gray, *Proc. Zool. Soc. London* 1858, p. 52 (Aru Islands, specimen collected by Wallace²).

♂. 7.vii.1923. "Iris deep red. Bill dullish yellow-green. Feet dull greenish yellow."

This specimen has the neck a little lighter than in our New Guinea examples, and it is smaller, bill shorter, wings only 132 mm. (wings in New Guinea 145-157,

¹ *Oedienemus magnivostris* Vieillot, *Nouv. Dict. d'Hist. Nat.* xxiii. p. 231 (1819—No locality! Mathews, *Nov. Zool.* xviii. p. 226, substituted "Binongka, Celebes" as typical locality. Such arbitrary fixing of type localities cannot be accepted. If a type locality is fixed, it must be the one from which the bird most likely came, that was described, or might have come. But Binongka is one of the Tukang Besi Islands, not on Celebes at all, but about 200 km. south-east of Celebes, and—unless Mathews discovered a reason that it was so, of which he left us uninformed—it is certain that Vieillot received no bird from these islands which were first explored, so far as the avifauna is concerned, by Heinrich Kühn: cf. *Nov. Zool.* 1908).

² This specimen, the type of *Rallina tricolor*, is not in the British Museum. Salvadori, in 1882, said he had examined the type, but I think this must be an error. The Tring Museum, however, bought a specimen from the late H. Whitely marked "Aru Islands," and this seems to be the type of *R. tricolor*. It is a typical "Wallace's skin," the neck, position of feet, etc., being "Wallacean." Probably the specimen was erroneously not kept by the British Museum and sent with other "duplicates" to Whitely for sale. This specimen has a rather dark throat and neck, but is probably not different from the New Guinea examples. This was accepted by Salvadori, though he said that his Aru specimen (collected by Beccari 1875) had the back more olivaceous than the three New Guinea ones. Our supposed type, however, is on the back exactly like Papuan specimens.—E. H.

but in a ♀ from the Sattelberg only 135, ♀ from Dampier Island—cf. Nov. Zool. 1915, p. 26—138, two unsexed from New Hanover 128, 132 mm.). It might therefore be the case that there is a smaller subspecies on the islands of the Bismarck Archipelago, but I think more material is required to be sure about this!

Only three forms may so far be looked upon as certainly distinguishable:

A. *E. tricolor tricolor* (Gray): Apparently Aru Islands, New Guinea, and neighbouring islands.

(Mathews, *B. Australia* i. p. 205, 1911, proposed for the "New Guinea subspecies" the name *E. tricolor grayi*, saying that the type was No. 187 in his collection. Apart from the detail that the type is labelled by the author himself 197, and not 187, that name is virtually a *nomen nudum*. No distinguishing characters are given, and the new name was evidently given under the impression that Sharpe had separated the New Guinea form from the Aru one. Sharpe, however, did not compare the New Guinea birds with Aru Islands birds, but he only talks of a specimen from Port Moresby as having white bars on the abdomen (!), while he says that a Dorey specimen is like the Australian birds! The type of "*Eulabeornis tricolor grayi*" is a New Guinea skin in native preparation, presumably from Dutch Papua, which has *not* white, but buff abdominal bars, and only a few of them!)

B. *E. tricolor robinsoni* Math. Australia (N. Queensland, chiefly Cape York Peninsula). Upperside more brownish.

C. *E. tricolor victa* (Hart.) Tenimber, Koer, and Dammar Islands, very much smaller.

(Sharpe, *Cat. B. Brit. Mus.* xiii. p. 79, says that he described a ♂ "type of species," but the type was a ♀ from Aru!)

5. *Porzana cinerea meeki* subsp. nov.

A very dark form, throat and longitudinal patch along middle of abdomen only white, jugulum and breast ashy grey, flanks dark brown, under tail-coverts in two specimens dark brown, in the third (? female, though marked male) more russet, as in other subspecies. Upperside dark, head brownish grey-black, not as clear blackish as in *leucophrys*. Wing 97, 91, 91 mm., middle toe without claw 42, 42, 40, tarsus 46.5, 47, 47.5 mm. "Iris dark red. Bill yellowish brown and black. Feet greenish slate-colour, yellowish green, dull bluish green" (A. F. Eichhorn). Type ♂ ad., St. Matthias Island, 30.vi.1923, No. 8619.

Named after Albert S. Meek, the organiser of Mr. Eichhorn's collecting expeditions, since he himself is unfortunately now unable to undertake such travels.

Three specimens were collected by Mr. Eichhorn, in June, all marked as males, but I suspect two being females.

This form is apparently very distinct from all the other named subspecies. The latter were discussed by Ingram in *Bull. B.O. Club* xxix. pp. 21–22, and the most recent short review is that of Mathews and Iredale in *Manual B. Australia* p. 202 (1921). Neither of them is, however, explicit enough. Ingram makes no mention of the distribution of the "typical," i.e. first-named form, and Mathews and Iredale, who designated Java as the most likely typical locality, do not mention any other place for it, while the Javan form is undoubtedly spread

not only over Java, but also Sumatra, Malay Peninsula, and I think the Lesser Sunda Islands and Moluccas, as well as Celebes. From New Guinea I have not examined specimens, except one said to be from Port Moresby, from Goldie; this bird is not like our St. Matthias Island ones, but seems to me to be indistinguishable from Australian specimens, and so is in my opinion the one from Timor in the British Museum.

It is difficult to believe that a specialised form of such a widespread bird as *Porzana cinerea* should be restricted to the little island of St. Matthias, but a male collected by Cayley Webster on New Hanover is underneath as white as most others, not grey like *meeki*! Unfortunately Eichhorn failed to come across the species on New Hanover, and we have no specimens from other islands of the Bismarck Archipelago.

P. cinerea parryi Mathews, from N.W. Australia, is not separable from *P. c. leucophrys*, as far as I can see.

So far, therefore, only the following forms appear to be recognisable:

Porzana cinerea cinerea (Vieill.): Java, Sumatra, Malay Peninsula, Lesser Sunda Islands, and apparently Celebes and satellites.

[Celebes birds have *very large bills*, but also *P. c. cinerea* has as a rule large bills. Celebes birds can only be united with *cinerea*, but are not *leucophrys*! If not *cinerea* they are a separate Celebes form!]

Porzana cinerea ocularis Ingram: Philippine Islands.—Very similar to *P. c. cinerea*, but head generally a little darker, sides of breast often more grey, flanks and under tail-coverts darker. Tarsus averages longer, but is not constantly longer! Perhaps also Guam and Ruk!

[Ruk and Guam birds are not like *cinerea*, but I can at present—with a series, but all bad skins (!) available—not say how they differ, if at all, from *ocularis*.]

Porzana cinerea brevipes Ingram: Iwotimo and Dionisio, Vulcano Islands, south of Japan.—Tarsus shorter, flanks and under tail-coverts more rufescent, bill deeper.

Porzana cinerea leucophrys Gould: Northern parts of Australia: N.W. Australia, Northern Territory, North Queensland (Cape York Peninsula).—Bill small. Head in adults black, underneath generally darker. To this form seem to belong the specimens (one adult!) from New Guinea ("Port Moresby") and one from Timor. Moluccan birds seem somewhat intermediate.

[*P. c. parryi* Mathews is not separable from *leucophrys*. Specimens from Buru and Batjan are somewhat intermediate between *leucophrys* and *cinerea*. The bills are not as large as in the Celebes birds, but generally a little bigger than in the average Australian ones. Colour on underside (under tail-coverts and flanks) as in Australian birds, i.e. a little duller and darker than in *P. c. cinerea*.]

Porzana cinerea tannensis (Forst.): From Fiji and Samoa.—Head and neck without or with very little slaty grey, very little, if at all, different from the back, on which the blackish centres are not so well developed. In the similarity of head and back these birds remind one of *P. c. meeki*, but the latter has the upperside much darker, a bluish grey (not white) chest, and much darker flanks, and under tail-coverts, which are rather light and bright in *tannensis*.

Porzana cinerea meeki: See above.

Porzana cinerea ingrami Brasil: New Caledonia.—I have only seen one

specimen with a damaged bill in the British Museum, which does not seem to have the bill as small as described by Brasil.

The undecided characteristics of some of these forms illustrate again what becomes more and more evident the more we get series from all sorts of localities : *That there are very distinct and constant local forms, but also others which do not show well-recognisable characters, partly forming connecting links between outstanding subspecies, partly not*, some series of specimens not being always absolutely like series from other localities, but having no good characters to recognise them by, and therefore they are better not given special names, the object of a name being a failure if such specimens cannot be generally recognised. The study of this little group also shows how important it is to have well-prepared and equally shaped skins in series, bad specimens sometimes not showing what good ones can show.

6. *Ducula rhodinolaema* (Scl.).

See anteà, p. 196.

8 ♂♀ ad., June and July 1923, 1 ♀ immat. 27.vi. The young bird is at once recognisable by its more pointed and slightly brown-tipped outer rectrices, some narrow whitish fringes on some of the wing-coverts, paler throat, and the colour of the upperside being more like that of a *D. van-wycki*.

7. *Ptilinopus solomonensis johannis* (Scl.).

Anteà, p. 197.

2 ♂ ad., 1 ♂ juv., 3 ♀ ad., June and July.

"Iris pale greenish yellow. Bill pea-green, on other labels slaty blue, probably this meaning slaty blue with pea-green distal end. Feet dark purplish red."

Wings ♂ ad., 123–126 mm. Also Squally or Storm Island !

The distribution of this bird is peculiar. It was discovered and only known from the Admiralty Islands (Manus). Webster discovered it on New Hanover, Heinroth on Nusa, Eichhorn got it on Rook, St. Matthias, and Squally Islands, as well as on Manus and New Hanover. *P. s. solomonensis* from the Solomon Islands is closely allied, but the lilac frontal patch is much darker, the wing averages (but is not always) shorter.

8. *Ptilinopus insolitus inferior* subsp. nov.

Formae *Ptilinopus insolitus insolitus* dictae persimilis, sed paullo minor, rostro minore, colore russato flexuram alae cingente distincto, tubere frontali minore.

Hab. : St. Matthias Island, type ♂ ad., 28.vii.1923. A. F. Eichhorn coll. No. 8688.

A series of nine adults and one jun., June and July.

"Iris creamy white. Bill pale greenish yellow. Feet plum red."

The wings measure 118–125 (females being smaller), in nine New Hanover specimens 122–130, in twelve from Duke of York, New Hanover and New Britain 125–138, once even 140 mm. The bill is clearly smaller in the St. Matthias series, and there is, surrounding the bend of the wing, a russet-brownish wash, which is only indicated, if at all visible in the birds from the other islands.

The orange patch on the abdomen seems to be generally a little deeper in colour, but this is a doubtful distinction, as it varies a good deal. The red frontal knob is not so elevated as in the skins from other islands. The measurements of the wings would seem to indicate that the New Hanover specimens were intermediate between *P. i. insolitus* (cf. anteà, p. 197), substituted locality New Ireland, and *P. i. inferior*, but a larger series is necessary to prove this!

9. *Gallicolumba beccarii eichhorni* subsp. nov.

Gallicolumba subsp. *G. beccarii johannae* dictae persimilis, sed alis brevioribus, collo antico pectoreque albidioribus distinguenda.

♂ ad.: Very similar to *G. beccarii johannae* (anteà, p. 198) but wings shorter (in six males 104–108 mm., as against 109, 110, 111, 112, 113 in *johannae*), and the whitish breast-shield more white: breast white for about 2 cm., crop and foreneck paler grey. Type: ♂ 7.vii.1923. A. F. Eichhorn coll. No. 8644.

“Iris dark brown. Bill black. Feet bright purplish red, plum red, or cerise.”

Eichhorn sent six males, five from Matthias, one from Storm Island, shot in June and July. Also a young bird, marked female, not quite full grown. The upperside is brown with a greenish tinge and glossy, but some feathers have rust-brown edges, on the head and sides of the neck some blue-grey feathers are putting in their appearance. Wing-coverts and secondaries rusty-brown with much lighter tips. Underside brownish salmon-buff, jugulum darker, throat almost whitish, flanks brown.

10. *Macropygia rufa goodsoni* subsp. nov.

Subsp. *Macropygia rufa krakari* simillima, sed maculis nigrescentibus rectricum exteriorum infra saturatoribus, fere nigris, necnon rostro paullum minore distinguenda.

Agrees in colour best with *Macr. rufa krakari*,¹ the underside being generally slightly lighter than in *M. rufa rufocastanea* from the Solomon Islands, and wings of the same length (♂ 144–150, ♀ 143–147 mm.), but the slate-coloured or blackish spots on the lateral rectrices of a deeper colour, almost black, and the bill in the series slightly smaller.

Type: ♂ ad., 5.vii.1923. A. F. Eichhorn coll. No. 8636.

Hab.: St. Matthias and Squally or Storm Islands.

“Iris pinkish red, red, or reddish yellow. Bill black. Feet red, cherry red, dark burnt red.”

Eichhorn collected six males, two females on St. Matthias and one male on Squally Island.

11. *Chalcophaps stephani stephani* Rehb.

Anteà, p. 198.

6 ♂, 2 ♀, St. Matthias Island, June and July 1923. ♂♀ Storm or Squally Island, 11.12.viii.1923.

These specimens agree with those of other localities, though not a single male has the wing longer than 147 mm., one 145, most only 142 mm. The length of wing, however, varies very much individually in other localities, only

¹ Rothschild and Hartert, *Nov. Zool.* 1915, p. 28, from Dampier or Krakari Island.

in *mortoni* from the Solomon Islands it is constantly greater, i.e. over 150, generally about 153–156 mm.

There is, however, another very distinct subspecies of *C. stephani*, the one from Celebes, which has the tail and upper tail-coverts much brighter reddish rufous, an obvious difference, apparently overlooked by nearly all ornithologists, myself included. This form must be called : *Chalcophaps stephani wallacei* Brüggem. 1876.

12. **Caloenas nicobarica nicobarica** (L.).

Columba nicobarica Linnaeus, *Syst. Nat.*, Ed. x. p. 164 (1758—Ex Albin, Nicobar Islands).

4 ♂♀ ad, June 1923. The iris is described on the labels as “dull brownish yellow, brown, and dark grey,” the feet as dark purplish red, bill black.

13. **Demigretta sacra** (Gm.).

A. dea sacra Gmelin, *Syst. Nat.* i. 2. p. 640 (1789—Tahiti ! Ex Latham). Nov. Zool. 1914, p. 285.

♂ 12.vii.1923, in the slate-coloured plumage, with two white spots on the throat.

Also on Squally Island.

14. **Accipiter hiogaster dampieri** (Gurney).

Antea, p. 200.

♂ ad., 27.vii.1923.

♀ juv. 7.vii.1923.

♂ ad. wing 199 mm. “Iris dark brown. Bill black. Feet deep yellow.”

15. **Micropsitta meeki proxima** R. & H.

Micropsitta meeki proxima Rothschild and Hartert, *Bull. B.O. Club*, xlv. p. 50 (1924—“St. Matthias and Squally Islands.” Type from St. Matthias).

10 ♂♀ ad., St. Matthias, May and June 1923. “Iris dark brown, bill light horn-colour, feet light horn-colour or pale ashy blue.”

2 ♂♀ Squally or Storm Island, 18.viii.1923. “Iris brownish yellow, bill slate-blue, feet dull horn-colour.”

This most interesting little Parrot is very closely allied to *M. meeki meeki* from Manus (Admiralty I.), but the sides of the head are lighter, not so blackish grey-brown, more yellowish grey, the yellow superciliary lines are distinct and wider, and more or less clearly connected across the forehead by a yellowish band. Wings longer, in ten males 65–67, in one ♀ 65, in another 63 mm., while the wings in our *meeki* measure 59–61·5 (not 5–961·5 !) mm.

(See description of *M. meeki meeki* Nov. Zool. 1914, p. 289.)

The—for the size of the bird—enormous feet are of course connected with the habit of these tiny Parrots of running up and round the stems of the trees like Nuthatches and Tree Creepers.

16. **Trichoglossus haematodus flavicans** Cab. & Rchw.

Antea, p. 201.

♂♀ 29, 30.vii.1923.

Also common on Squally or Storm Island.

Neither of the two specimens from St. Matthias deserves very much the

name "*flavicans*," though the male is purer grass-green, the female having a yellow tinge. Among the Storm Island skins two are quite yellowish, the other four grass-green. Cf. anteà, p. 201, and Nov. Zool. 1914, p. 290.

17. *Halcyon matthiae* Heinr.

Halcyon matthiae Heinroth, *Journ. f. Orn.* 1902, p. 438. Pl. VIII. fig. 1 (St. Matthias Island).

5 ♂, 5 ♀ end of May and June. "Iris dark brown. Upper bill black, lower white, cutting edge and distal third black. Feet dull slaty, dull slaty blue, dull black." Wings ♂ 108–110, once 113, ♀ 107–113 mm.

The plumage is well described by Heinroth, who brought home a single specimen, shot in March on St. Matthias Island. Rump and upper tail-coverts are greenish blue, almost of the same colour as the tail, not light sky-blue, as in the figure in the *Journal für Ornithologie*. The crown, in fresh plumage, is rusty buff, as a rule darkest on the nape, but this colour fades, so that the crown is nearly white in worn plumage. The eyelids and spot behind the eyes, as well as the ring around the crown are black. The whole underside is pure white, without any black edges to any feathers. The amount of black on the crown varies from one small spot near the occiput to one large spot in the middle and a number of smaller ones all over the crown.

Halcyon albicilla saurophaga occurs also on Squally Island, where *H. matthiae* too is found. Though it is not known that both forms breed there, we must not treat *H. matthiae* as a subspecies of *H. albicilla* and *saurophaga*, and I cannot see that it can be united into the same chain of forms with any other known Kingfisher. See for further remarks in the list of birds from Squally Island.

This fine Kingfisher is common on St. Matthias Island.

18. *Halcyon sancta sancta* Vig. & Horsf.

Halcyon sanctus Vigors and Horsfield, *Trans. Linn. Soc. London*, xv. p. 206 (1827—"Australia"; evidently N.S. Wales; cf. Mathews, *List B. Australia*, p. 149).

2 ♀, 6., 23.vi.1923.

19. *Alcedo atthis pelagica* Stres.

Anteà, p. 203.

3 ♂ ad., 2 ♀ ad., 3 ♂♀ juv., June and July 1923.

Wings 67–71.5 mm.—In the list of the birds of New Hanover I omitted to say that Eichhorn sent us 1 ♂, shot 23.viii.1923, wing, 71 mm.

1 ♂ was shot on Squally Island.

20. *Merops ornatus* Lath.

Anteà, p. 205.

One female, 20.vii.1923. Middle tail feathers worn, some quills moulting, also some moult on body plumage.

21. *Eurystomus orientalis neohanoveranus* (?).

Anteà, p. 205.

♀ juv., 11.vii.1923.

There is hardly any doubt that this is a specimen of *E. o. neohanoveranus*, but without adult birds this is not absolutely certain. Nearly the whole culmen is blackish, the feathers of the back are mixed brown, greenish and purplish-blue.

22. *Hemiprocne mystacea aëroplanes* Stres.

Anteà, p. 206.

♀ 4.vii.1923. Wing 220.5 mm.

Though separable on an average, some New Guinea examples cannot be separated, having the wings not longer and the back equally pale.

23. *Collocalia fuciphaga vanicorensis* (Quoy et Gaim.).

See Nov. Zool. 1924, p. 206 (anteà).

An adult male was shot 18.vii.1923. Like the specimens from New Hanover it seems to me to belong to *vanicorensis*. The tarsus is bare of feathers, the wing measures 120 mm.

24. *Collocalia francica eichhorni* subsp. nov.

Collocalia francica fascia uropygiali albida lata, plane distincta a formis omnibus orientalibus distinguenda.

The specimens from St. Matthias Island (and New Ireland) differ from the other oriental forms (*spodiopygia*, *assimilis*, *townsendi*, *terraereginae*, and *reichenowi*) by the more pronounced, fairly wide, brownish white band across the rump, and somewhat short wings.

Stresemann (Nov. Zool. 1912, p. 350) described *Collocalia francica reichenowi* as inhabiting the Solomon Islands, New Ireland, and New Britain, but as his type was from Guadalcanar (Solomon Islands), I restrict the habitat to the latter, as far as we know at present. Only two specimens from the Solomon Islands are known, both from Guadalcanar, one in the British Museum, one at Tring; both have the rump band narrower, and the underside more brownish. I therefore name the birds from St. Matthias Island *C. francica eichhorni*. Type: ♂ ad., St. Matthias 10.vi.1923. No. 8532 of the Meek collections, collected by Albert F. Eichhorn. Wing ♂ 100, 103, 103.5, ♀ 102, 102, 102 mm. Eichhorn sent nine specimens, but three are moulting their primaries, so that their wings cannot be measured satisfactorily. The moulting birds were shot in June. Three skins from New Ireland, collected January 1924, are perfectly similar to the St. Matthias ones, but the wings measure 102 ("♂") and 107 ("♀")! The wing of the third is damaged. No doubt they must belong to *C. f. eichhorni*, and so must the one from New Britain with a wing said to measure 100 mm., but Reichenow's measures are as a rule very short.

25. *Monarcha menckei* Heinr.

Monarcha menckei Heinroth, Journ. f. Orn. 1902, p. 451. Pl. IX. fig. 1 (St. Matthias Island).

4 ♂ ad., 1 ♀ ad., 5 immature, St. Matthias Island, end of May and June. "Iris dark brown. Bill slaty blue, chalky blue. Feet slaty blue."

This most peculiar species is, as already stated by Dr. Heinroth, not rare on St. Matthias Island, but only one skin was saved, the others being lost during the attack. The forehead, the eyes, ring round eyes, and a spot on the ear-coverts are black, the whole rest of the upperside from the crown to and including the upper tail-coverts is snow-white. The wings are black, the three innermost secondaries, tips of wing-coverts, with the exception of the median series, and edges of primary-coverts white. Tail-feathers black, tips white for about

17–20 mm. on the outermost pair, the white tips decreasing in extent towards the middle, the central pair being entirely black, the next one also, with or without a narrow white border. Throat black, sometimes with a few white feathers, rest of underside, including under wing and under tail-coverts white. The tail is strongly rounded. Wing adult males 71·5–74, adult female 68 mm., tail 63·5–65·5 mm. The sexes are alike in colour.

The young bird, however, is quite different, the whole upperside from the bill to the tail is black, some of the feathers with ash-grey edges, these latter being apparently remains from the very first nesting plumage, in which also the wing-coverts seem to have grey-brownish fringes instead of white tips, and the quills greyish-brown edges. Four of the juvenile birds have the upperside white and black. The youngest bird with entirely black upperside has the basal half of the under mandible “brownish yellow.” This young bird has some resemblance with the adult of *Monarcha pileatus buruensis*, which, however, differs widely in having elongated throat-feathers, in being more black on the throat, having a white ear-patch, and a totally different white wing-patch. The adult bird stands quite by itself.

26. *Monarcha cinerascens perpallidus* Neum.

Monarcha cinerascens perpallidus Neumann, *Orn. Monatsber.* 1924, p. 39 (“Nördl. Neu-Mecklenburg, Neu-Hannover, Portland-Inseln westlich von Neu-Hannover”).

7 ♂, 1 ♀, June and July 1923. “Iris dark brown. Bill and feet slaty blue.” Also Storm or Squally Island and New Hanover. Cf. anteà, p. 208.

This is a very distinct form with rather pale upperside, throat and chest, and much paler abdomen, of a light ochraceous-buff colour. Wings, ♂ 84–85, ♀ 80–81 mm. The young female mentioned, p. 208, from New Hanover, belongs also to this form. Neumann has explained that the name *fulviventris* Hartl. cannot be used for this pale-bellied subspecies.

27. *Monarcha hebetior* spec. nov.

♂ ad., differs from *M. chalybeocephalus* in its various races by being less glossy; the feathers of the crown are shorter, so that the distinct cap is not obvious, ear-coverts and sides of head are more blackish and practically devoid of gloss; the feathers of the throat and chest are shorter and looser, and they are of almost the same colour throughout, while in *M. chalybeocephalus* the distal portion is glossy steel-blue, the base glossless slaty black. Bill smaller, wings and tail shorter. Wings 73–78, tails 60–62 mm. “Iris dark brown, bill slaty with black tip, feet slaty black.”—♀. ad. crown deep steel-blue, darker blue than in *chalybeocephalus*, back rufous, quills black-brown, secondaries with wider, primaries with narrower rufous outer edges; tail blackish brown, outer pair of rectrices with outer web rufous, the rest only with rufous outer edges. Wing 70, 72 mm.—♂♀ juv. Resembles the adult female, but the crown is dark umber brown, not steel-blue, the bill is yellowish at base, and there is a rufous-buff wash across the chest.

Type of *M. hebetior* ♂ ad. 30.v.1923. A. F. Eichhorn coll. No. 8479.

We received 6 ♂ ad., 2 ♀ ad., 2 juv. of this most interesting new bird, shot in June and July 1923.

Anteà, p. 208, I mentioned two males of a *Monarcha*, shot on New Hanover,

together with *Monarcha alecto chalybeocephalus*. Since the new *M. hebetior* was discovered I have come to the conclusion—and Lord Rothschild agrees with me—that this New Hanover bird is a subspecies of *M. hebetior hebetior*. It agrees with the latter in the structure of the body plumage, but is much larger (wings 84 and 85), and slightly more purplish, chest even more glossless, and abdomen brownish black. I name this bird

***Monarcha hebetior eichhorni* subsp. nov.**

Hab.: New Hanover. *Type*: ♂ ad. 3.iii.1923. A. F. Eichhorn coll. No. 8256.

The form from St. Matthias Island must therefore be called *Monarcha hebetior hebetior*.

28. *Rhipidura rufiventris mussaui* subsp. nov.

Subspeciei *Rhipidura rufiventris gularis* dictae simillima, sed notaeo pectoreque paullo saturationibus, rostro multo latiore distinguenda.

Type: ♂ St. Matthias Island 11.vi.1923. Albert F. Eichhorn leg. No. 8540.

This form differs widely from *Rhipidura rufiventris albertorum* (Nov. Zool. 1924, p. 207) of New Hanover and *Rh. ruf. niveiventris* (Nov. Zool. 1914, p. 295), in having the middle of the abdomen buff, not white! The nearest form is *Rh. ruf. gularis*, but the bill is much wider, measuring at base about 10 mm., while in *gularis* it does not surpass 8 mm. The breast-band and back are slightly darker, more slate-colour. Wings 87–90.5 mm., the 87 ones labelled ♀, the 90.5 ones ♂. The abdomen in five fairly fresh-plumaged birds is buff, but in two in partially worn old plumage, moulting, upper wing-coverts and rump with some rufous-buff edges, indicating youth, it is white; these have wings of 82 (“♀”) and 87 (“♂”) mm. “Iris dark brown. Bill and feet black.”

All specimens from St. Matthias Island, not sent from Squally Island.

From *Rh. ruf. setosa* of New Britain and Duke of York Islands this form and the near allies differ in the much narrower white edges to the inner secondaries.

29. *Rhipidura matthiae* Heinr.

Rhipidura matthiae Heinroth, *Journ. f. Orn.* 1902, p. 457. Pl. IX. fig. 2 (St. Matthias Island).

Eichhorn sent six adults, all labelled ♂, and a juvenile specimen, collected in May, June, and July. The wings measure 72.5–74.5 mm. “Iris dark brown, bill black, feet slaty blue, dull slate, dark slate-colour.” These birds agree well with the original description. The figure is also good, except that the back and tail are chestnut, not so red as in the figure, and the black merges gradually into the brown of the flanks. The not fully adult male, “♂” 7.vii.1923, No. 8643, has the base of the lower mandible yellowish (in skin), the dark colour of occiput and chest is not pure black, but dark brown, and the abdomen is suffused with chestnut-red.

This *Rh. matthiae* has no very near ally, and one cannot conscientiously say that it is a subspecies of any known species. *Rh. dahl*i appears to be quite different, though not known to me.

30. *Lalage conjuncta* Rothsch. & Hart.

Lalage conjuncta Rothschild and Hartert, *Bull. B.O. Club*, xliv. p. 51 (1924—St. Matthias Island).

One male 30.vii.1923. No. 8691.

No other specimen met with. Upperside black with greenish steely gloss, lower rump white, upper tail-coverts partially wanting, those present with very narrow white edges. Quills black, greater upper wing-coverts white, the longest series with black inner webs; inner edges to primaries and outer edges to secondaries white. Tail black, outer rectrices with white tips. Lores black, sides of head from under the eyes white, abdomen and under tail-coverts light chestnut. Thighs black and white. Under wing-coverts white, spotted with black near outer edge. Left wing 93, tail 77 mm. "Iris dark brown. Bill black. Feet dark slate."

This species seems to stand by itself. By the colour of the underside it connects *Lalage aurea* with its chestnut under-surface, with the *L. karu* group with white underside but barred breast; with the *atrovirens* group it agrees in the pure white breast and absence of a white superciliary line. Unfortunately no female was obtained, which would have been of particular interest.

31. *Edolisoma morio* subsp. nov. (?).

We have received one adult male from St. Matthias, one adult male and one young bird, marked "♂," but must be a female, from Squally or Storm Island. These birds, that is to say the males, are like the males of *remotum*, from New Hanover, and only a shade lighter than our only male from Rook Island! The young bird, however, has three new feathers on the lower throat, which are buff and barred as in the female of *rooki*, and a few feathers on the rump, which are more like feathers of the rump of *rooki* than like those of ♀ *remotum*, which has the underside unbarred rufous. Having only one male of *rooki*, and no adult female from Squally or St. Matthias Islands, and not being acquainted with the New Britain form (*Edol. morio heinrothi* Stres.), it would be hazardous to give a name to the birds from St. Matthias and Squally Islands; it must be added that they are also very much like *admiralitatis* from the Admiralty Islands, but very much larger, namely as large as *rooki* and *remotum*.

32. *Phylloscopus trivirgatus matthiae* Rothsch. & Hart.

Phylloscopus trivirgatus matthiae Rothschild and Hartert, *Bull. B.O. Club*, xliv. p. 52 (1924—St. Matthias Island).

Two specimens 15.vii. and 21.vii.1923, both marked as males.

Subspeciei *Phyll. trivirgatus giulianettii* dictae similis, sed capitis lateribus striisque superciliaribus grisescentibus, nec flavescens, striis ocularibus griseis, nec nigrescentibus, pileo grisescentiore, tergo flavescens, rostro longiore primo visu distinguendus.

The iris is described as dark brown, bill blackish brown, base of lower mandible dull yellowish brown-colour, feet pale slaty-blue. Wings 51.5 and 53 mm.

The occurrence of a *Phylloscopus* on St. Matthias Island is of great interest, and we may suspect that other, hitherto unknown, forms may be discovered on

other of the Papuan and neighbouring islands. As *giulianetti* is connected with the Moluccan forms, they must be treated as subspecies.

33. *Turdus dauma eichhorni* Rothsch. & Hart.

Turdus dauma eichhorni Rothschild and Hartert, *Bull. B.O. Club*, xliv. p. 52 (1924—St. Matthias Island).

Turdus subspeciei *T. dauma papuensis* appellatae similis, sed alis multo brevioribus, uropygio tergoque fere similibus, plumarum marginibus subtus angustioribus, primo visu distinguendus.

Of this very distinct form Eichhorn sent us eleven specimens, shot on St. Matthias Island in May, June, and July 1924. The wings of the males measure 109–112, females 107–107.5 mm. "Iris dark brown. Upper bill blackish, lower light brown or horn-colour. Feet very light horn-colour.

In 1904 we received from Choiseul, Solomon Islands, a female with body plumage in partial moult, which we duly registered in Nov. Zool. 1905, p. 265, as "*Geocichla papuensis* subsp. nov. (?)." Since then we have seen more specimens of *G. papuensis papuensis* from New Guinea, and can say without hesitation, that the Choiseul bird is adult, though moulting, and differs from *Turdus papuensis papuensis* in the much narrower dark tips to the feathers of the under-side; thus it resembles *T. p. eichhorni*, but the rump is much more rufescent, and the wing measuring 115 mm. is much longer. I name this form

Turdus dauma choiseuli subsp. nov.

Type: ♀ Choiseul Island, 13.i.1904. A. S. Meek coll. No. A1148.

The presence of the *Turdus dauma eichhorni* on St. Matthias, and of the *choiseuli* on Choiseul suggests the probability of other undiscovered Thrushes on other islands of the Bismarck Archipelago and the Solomon group.

Two eggs of *T. d. papuensis* were found on the Sattelberg in Kaiser-Wilhelms-Land in August 1911 and sent to us by the late Professor Förster. They are dull pale bluish with reddish brown spots, resembling certain eggs of Blackbirds and Redwings. As the eggs are broken to pieces measurements cannot be given.

34. *Turdus melanarius heinrothi* Rothsch. & Hart.

Turdus melanarius heinrothi Rothschild and Hartert, *Bull. B.O. Club*, xliv. p. 53 (1924—St. Matthias Island).

Turdus subspeciei *Turdus melanarius melanarius* dictae persimilis, sed pileo brunnescentiore, alis brevioribus.

Wings 111 to 112 mm. "Iris dark brown. Bill cadmium yellow. Feet yellow and brownish."

The browner head distinguishes this form from *T. m. melanarius*, as well as the shorter wing. The whole upperside and wings are browner, less blackish, but the specimen's plumage being partially worn, this difference requires confirmation by more specimens.

The presence of this Blackbird suggests that it or similar forms occur on other islands of the Bismarck Archipelago.

Named after Dr. Heinroth, the first ornithological collector who visited St. Matthias Island in 1901.

35. *Pachycephala pectoralis sexuaria* Rothsch. & Hart.

Pachycephala pectoralis sexuaria Rothschild and Hartert, *Bull. B.O. Club*, xliv. p. 50 (1924—St. Matthias Island).

♂ ad. mari subspeciarum *Pachycephala pectoralis finschi* et *goodsoni* appellatarum similis, sed ♀ multo differt: tergo pileoque olivascenti-rufis, abdomine luteolo.

4 ♂ ad., 1 ♂ in change from juvenile to adult plumage, 3 ♀ ad., St. Matthias Island, May to July.

The adult males are very similar to those of *P. p. finschi* and *pectoralis*, the yellow of the abdomen somewhat between the two, not so orange as in *P. p. goodsoni*. Bill smaller than in *goodsoni*, same size as in *finschi*. The females have head like the back, olivaceous-rufous, the back not green, though the rump is slightly tinged with yellowish-green. Abdomen rich buff, in one tinged with yellowish brown, but not yellow. Smaller: wing ♂ 89–90, ♀ 87–88 mm. The young male was shot 29.v.1923. "Bill ♂♀ black, iris dark brown, feet slaty-blue."

36. *Myzomela nigrita ramsayi* Finsch. (?).

Myzomela ramsayi Finsch., *Zeitschr. ges. Orn.* iii. p. 21 (1886—Islands of Kapaterong and Nusa, near New Ireland).

Mr. Eichhorn sent us 4 ♂ ad., 1 ♂ juv., in moult, 1 ♀ ad., 2 ♀ juv., from St. Matthias Island. The adults are glossy black, wings ♂ 66–67, ♀ 63 mm. They would thus appear to have shorter wings than *ramsayi*, of which, however, we have only one adult male from New Hanover—see Nov. Zool. 1924 (antea), p. 211, but I can now only make the wing 70 mm. long, not 72. If all specimens from the typical localities (and New Hanover ?) are larger, the St. Matthias form would be separable, but this cannot be said, until a series from Kapaterong and Nusa is to hand.

"Iris dark brown. Bill black. Feet slaty-blue to dark slate."

37. *Cinnyris jugularis flavigaster* (Gould).

Nectarinia flavigaster Gould, *Proc. Zool. Soc. London* 1843, p. 104 (New Ireland).

4 ♂, 4 ♀ from St. Matthias, 1 ♂, 1 ♀ from Squally or Storm Island. The wings of the males measure 54 to 55 mm. A series from New Ireland must be examined to show if the latter have longer wings.

38. *Erythrura trichroa eichhorni* subsp. nov.

Erythrura subspeciei *E. t. goodfellowi* dictae simillimus, sed colore caeruleo frontis magis extenso.

Type: ♂ ad., St. Matthias Island 5.vii.1923. No. 8635.

This new subspecies is nearest to *E. t. goodfellowi* from the hills of S.E. New Guinea (north to the mountains of the upper reaches of the Sepik River—and perhaps farther), Vulcan, Dampier, and Sudest Islands, but differs in the blue of the forehead farther; in *E. t. goodfellowi* it reaches in the middle as far as the eyes, while in *eichhorni* it extends, at least in the males, far beyond, over the vertex; the blue is also in the series a little lighter; in the females this is not quite so developed. Wings 57.5–60, in *goodfellowi* 60–63 mm.

E. t. eichhorni differs from *E. t. papuana*, from Arfak, in its smaller bill

and shorter wings and tail. *E. t. woodfordi* from Guadalcanar is also larger than *E. t. eichhorni*.

E. t. cyaneifrons (New Hebrides) has the bill thicker and much shorter than in *E. t. eichhorni*.

Mr. Eichhorn sent six adults and two young from St. Matthias, and two from Squally or Storm Island. The iris he marked as dark brown ; bill, adult, black, juv. under mandible, tip and cutting edge of upper dull yellow, rest of upper black ; feet of adult smoky horn-colour to dull blackish, young light smoky horn-colour.

39. *Aplonis metallica nitida* (Gray).

Anteà, p. 212.

Common on St. Matthias and also found on Squally Island.

THE BIRDS OF SQUALLY OR STORM ISLAND

By ERNST HARTERT.

SQUALLY or Storm Island, Sturminsel, Keruë or Hunter Island, lies between St. Matthias and New Hanover, but much nearer to the former, under 150° eastern long. and 1° 40' southern lat. It used to be depicted as extending from north to south, but according to Parkinson and Vahsel it extends from west to east, and is about 14 km. long (Meyer, *das Deutsche Kolonialreich* II, p. 454). It is an elevated coral reef, surrounded by more recent coral reefs, and is partially wooded, while the coasts are covered with coconut palms and inhabited by 500 to 700 natives. On this island Dr. Duncker had collected 4 species of birds, and Mr. Eichhorn was marooned on it for some time in 1923. During this time he collected 21 species, as the following list shows.

The birds of Squally Island are throughout the same as those from St. Matthias Island. There is hardly any literature, only:

1922: Martens (& Duncker), "Vög. der Südsee-Expedition der Hamburger Wissenschaftl. Stiftung, 1908-1909," in *Archiv. f. Naturg.* 1922 A, Heft 6. (Four species mentioned.)

1924: Rothschild & Hartert, *Bull. B.O. Club*, xliv. p. 50 (*Micrositta meeki proxima* mentioned as also occurring on Squally Island).

1. **Megapodius duperreyi eremita** Hartl.

♂ ad., Squally Island, 14.viii.1923.

2. **Tringa hypoleucos** L.

♂♀, Squally Island, 15.viii.1923.

3. **Ptilinopus solomonensis johannis** (Scl.).

2 ♂ ad., Squally Island, 3.5.viii.1923.

Duncker collected a specimen 30.ix.1908.

4. **Gallicolumba beccarii eichhorni** Hart.

1 ♂ ad., Squally Island, 12.viii.1923.

See anteà, p. 266.

5. **Macropygia rufa goodsoni** Hart.

1 ♂ ad., Squally Island, 11.viii.1923.

See anteà, p. 266.

6. **Chalcophaps stephani stephani** Rehb.

♂♀ 11.viii.1923. Collected by Duncker on Squally Island, 1.x.1908.

See anteà, pp. 198, 266.

7. **Caloenas nicobarica nicobarica** (L.).

Duncker collected a specimen on Squally Island, 30.ix.1908.

8. **Demigretta sacra** (Gm.).

♂, Storm or Squally Island, 14.viii.1923, in white plumage.
See anteà, p. 267.

9. **Haliastur indus girrenera** (Vieill.).

♂ ad., Storm or Squally Island, 8.viii.1923.
See anteà, p. 200, and Nov. Zool., 1914, p. 210.

10. **Micropsitta meeki proxima** Rothsch. & Hart.

♂♀, Squally or Storm Island, 18.viii.1923.
See anteà, p. 267.

11. **Trichoglossus haematodus flavicans** Cab. & Rehw.

4 ♂, 2 ♀, Squally or Storm Island, 7 and 10.xiii.1923.
Two are yellowish, four grass-green. See anteà, p. 267.

12. **Halcyon albicilla saurophaga** Gould.

Halcyon saurophaga Gould, *Proc. Zool. Soc.*, 1843, p. 103 (New Guinea).

♂ ad., Storm or Squally Island, 9.viii.1923. "Iris dark brown. Bill black, base of under mandible whitish. Feet blackish slate colour."

There can be no doubt that *H. albicilla albicilla*, *godeffroyi*, *owstoni*, *admiralitatis* and *saurophaga* are subspecies of one and the same species, but it was hazardous of Stresemann to draw also *H. matthiae* into this chain; the contrast of the colours of the upperside, the upper back and scapulars being black-green, in contrast to the greenish blue (not sky-blue as in the figure in the *Journ. f. Orn.*) rump and upper tail-coverts, the black line encircling the crown, black (not blue) patch behind the eyes, etc., being striking characters. Moreover, *H. matthiae* and *saurophaga* have now both been found on Storm or Squally Island. *H. a. saurophaga* was collected by Hüsker long ago on New Hanover, but Eichhorn did not come across it.

13. **Halcyon matthiae** Heinr.

2 ♂, Storm Island, 3.11.viii.1923.
See anteà, p. 268.

14. **Alcedo atthis pelagica** Stres.

♂ ad., Squally Island, 3.viii.1923.
See anteà, pp. 203, 268.

15. **Merops ornatus** Lath.

6 ♂♀, Squally Island, August 1923.
See anteà, pp. 205, 268.

♂ ad. 9.viii. in most wonderful fresh full plumage. Specimens from 6th to 14th August still more or less in moult.

16. **Hemiprocne mystacea aëroplanes** Stres.

Anteà, pp. 206, 269.

1 ♂, 3 ♀, August 1923, Squally Island. Wings 215-222 mm.

17. **Monarcha cinerascens perpallidus** Neum.

2 ♂, Storm or Squally Island, 16.viii.1923.

See anteà, p. 270.

Also mentioned by Martens and Duncker as *Monarcha inornatus*.

18. **Edolisoma morio** subsp. nov. (?).

♂♀ juv., Storm or Squally Island, 13.viii.1923. See remarks in list of St. Matthias birds, anteà !

19. **Cinnyris jugularis flavigastra** (Gould).

♂♀ ad., Storm Island, 17.viii.1923. See list of St. Matthias birds.

20. **Erythrura trichroa eichhorni** Hart.

Anteà, p. 274.

♂♀, from Storm or Squally Island.

21. **Aplonis metallica nitida** (Gray).

Anteà, pp. 212, 275.

♂♀ ad., from Squally Island.

ON *HYPOCYSTA* AND SOME ALLIED GENERA OF *SATYRINAE* (LEP. RHOP.) FROM NEW GUINEA AND THE SOLOMON ISLANDS

By DR. KARL JORDAN.

IN Seitz, *Macrolep.* ix. p. 295 ff. (1911), Fruhstorfer gave a survey of the forms of *Hypocysta*, *Argyronympha* and some other genera which was based to a great extent on specimens lent to him by the Tring Museum. When incorporating these named and returned specimens and comparing the original descriptions with the account given in Seitz, it soon became evident to me that, probably owing to insufficiency of material and lack of literature, the account suffered from errors in identification, omissions and other misleading inaccuracies, which it would be of some interest to correct. In attempting to revise Fruhstorfer's survey I am well aware of the difficulties involved, particularly in the genus *Hypocysta*, most species of which do not present any differences in structure and therefore often leave us in doubt about their true standing in classification. Since 1911 quite a number of new forms have been discovered, and future discoveries will no doubt further modify the views as to the relationship of the forms in each genus.

The genera here dealt with have three veins of the forewings swollen, and their ♂♂ lack those scent-organs which are so strongly developed on the wings of *Mycalesis* and allies. They form an Australian-Papuan group which does not extend westward beyond Aru, Misol and Weigeu, and which is closely related to some Australian genera, such as *Oreixenica* and *Argynnina*.

I. *Hypocysta* Westw. (1851).

Eyes naked, with distinct traces of hairs only under high magnification. Tibiae and tarsi without spines on the upperside. In forewing the cell-apex deeply angulate, a vein extending far into the cell from this angle, upper cell-angle acute, projecting; hindwing shorter in anterior half than in posterior, precostal evenly curved outwards, upper cross-vein short, second long, upper cell-angle larger than lower, R^2 as long as R^1 , much shorter than the cell. Genitalia of ♂♂ very uniform: anal tergite lanceolate, with the tip obtuse or acuminate; below it, but lateral in position, a long spiniform process (anal sternite) which reaches about to the middle of the tergite; clasper long, broad in basal third, apical two-thirds narrow, apex curved inward and spiniform, sharp. Two sharply defined groups of species:

A. Hindwing above at least with a clay-coloured patch in outer half; subanal ocellus simple, with a single white pupil.—Five Australian species, which are all described and well figured in Waterhouse & Lyell, *Butterfl. Australia*, p. 33, figs. 79–81, 86–89, 142–147 (1914). In that work *adiante* and *antirius*, which figure as separate species in Seitz, are treated as eastern and western subspecies of one species.

B. Hindwing with white median area or almost uniformly yellowish brown; posterior ocellus with two or three white pupils.

6. **Hypocysta haemonia** Hew. (1863).

Posterior ocellus of hindwing tripartite, with three white pupils.
Aru and New Guinea.

a. **H. haemonia haemonia** Hew. (1863).

H. h. fenestrella Fruhst. in Seitz, *Macrolep.* ix. p. 297 (1911) (Sekar).

Upperside without white median area, but slightly paler than the base.

Aru (terra typica); Onin Peninsula, Dutch S.W. New Guinea; Aroa R. and Brown R. in British New Guinea.

I do not find any difference between our specimens from Aru and New Guinea.

b. **H. haemonia plusiota** Fruhst. (1911).

H. haemonia Hew., Grose-Smith, *Nov. Zool.* i. p. 364, no. 162 (1894) (Humboldt Bay).

Upperside in ♂♀ with a pale median area, which is white at least on the hindwing though somewhat impure. Length of forewing 20 mm., in *H. h. haemonia* 18 to 19 mm.

Humboldt Bay, north coast of Dutch New Guinea near the frontier of mandated German New Guinea.

7. **Hypocysta aroa** Beth.-Bak. (1908).

Forewing above in ♂♀ hairy in the cell as well as beyond it from M^2 to R^1 or to costal margin. White area of hindwing pure white, with sharply projecting angle before middle, on upperside the yellow ring of the double ocellus indistinct. On underside the costal vein and margin of forewing without yellow hairs at base; on hindwing the black space between the two metallic rings broader than a metallic line, at termen without distinct brownish yellow line; the white area at its widest point before middle broader than at abdominal margin.

New Guinea.

a. **H. aroa aspis** subsp. nov.

H. osyris Boisd., Oberth., *Ann. Mus. Civ. Genova* xv. p. 518 (1880) (partim; Andai).

H. osyris var., Butler, *Cat. Satyridae* p. 167. sub no. 4 (1868) (Dorey).

H. aroa serapis Fruhst. (nec Grose-Smith 1894), in Seitz, *l.c.* (1911) (Dorey).

On upperside the white band of the forewing almost suppressed in ♂, vestigial, the white area of the hindwing extending to lower angle of cell or very little beyond. Below, the white band of forewing entering cell neither in ♂ nor ♀, or a very little.

North side of Dutch New Guinea: type of *aspis* in Mus. J. J. Joicey from coast near Manokvari, January–February 1914 (Pratt), paratype in Mus. Tring, another specimen (♂) from Amberbaki in Mus. Paris (Raffray & Maindron). Further material may prove this form really to belong to *H. osyris*.

b. **H. aroa aroa** Beth.-Bak. (1908).

Forewing above in ♂♀ with white band that is traversed in ♂ by partly black veins and anteriorly shaded with black, entering the cell in both sexes; on the hindwing, above, the white area extends distad beyond lower cell-angle.

British New Guinea: Aroa R., in the mountains at 4,000–5,000 ft.

8. *Hypocysta angustata* Waterh. & Lyell (1914).

H. aroa angustata Waterhouse & Lyell, *Butterfl. Austral.* p. 34. no. 29a. figs. 148, 149. ♂ (1914) (Claudie R.; Coen; ♂♂, ♀).

♂. Forewing, above, without hairs on disc behind cell, veins not blackish, the white band (♂) more or less shining through from beneath; white area of hindwing shaped as in *H. aroa*, extending to lower cell-angle; ocellus as in *H. aroa*. On the underside base of costal margin and vein of forewing with yellowish hairs, white band sharply defined; on the hindwing the white area extended basad close to base of cell, a little wider behind than in *H. aroa*; metallic rings as far separate as in *H. aroa*, at termen a yellowish line. Foreleg of ♂ black mixed with white (entirely black in *H. aroa*).—♀ not known to me.

New Guinea; North Australia.

a. *H. angustata pellucida* Joic. & Talb. (1922).

H. osyris Boisd. *pellucida* Joicey & Talb., *Bull. Hill Mus.* i. p. 328 (1922) (south side of Geelvink Bay).

Hindwing above yellowish instead of white.

At low altitudes south of Geelvink Bay, Dutch New Guinea.

b. *H. angustata angustata* Waterh. & Lyell (1914).

The white area of the hindwing above and below and of the forewing below without yellow tint. Australian specimens not known to me. Our only example from British New Guinea bears on the forewing beneath at the termen traces of a double line, of which the inner one is metallic, the outer one yellowish.

British New Guinea: Aroa R., 2,000 ft., May 1905 (A. S. Meek), one ♂.

North Australia: Claudie R. and Coen, Cape York Peninsula.

9. *Hypocysta osyris* Boisd. (1832).

♀. *Satyrus osyris* Boisduval, *Voy. Astrol., Entom.* p. 154. no. 17 (1832) (Offak).

Satyrus? osyris Boisd. Doubl. & Westw., *Gen. Diurn. Lep.* i. p. 392. no. 48 (1851) (Offak).

Hypocysta osyris Boisd., Butler, *Cat. Satyridae* p. 167. no. 4 (1868) (partim); Kirby, *Cat. Diurn.*

Lep. p. 101. no. 4 (1871) (partim; "Aru," "New Guinea" ex errore); Fruhst., in Scitz, *Macrolep.* ix. p. 296 (1911).

All the remaining forms with a white median area I consider to belong to one species. The forms replace one another geographically as far as they are known; but there are still great gaps in our knowledge of their distribution, no forms being as yet known from the Arfak Peninsula and the large coast tracts between the mouth of the Fly R. and the Snow Mts. of Dutch New Guinea.

Upperside of forewing hairy on the disc; yellow ring of double ocellus of hindwing distinct above. White band of forewing above in ♂ more or less suppressed or diffuse. On underside the metallic rings of hindwing closer together than in *H. aroa* and *H. angustata*, at termen of hindwing a yellowish line. The brownish black terminal band of the hindwing, above, extends to or usually into the cell. In those ♂♂ in which the abdominal margin of the hindwing is not shaded with blackish brown the hindmargin of the forewing beneath

and the costal margin of the hindwing above are blackish, with a few exceptions. Three groups of forms :

A. Costal margin and vein of forewing beneath without yellow hairs at base.

a. *H. osyris osyris* Boisd. (1832).

♀. *H. osyris* Boisd., l.c. (Offak).

♂♀. *H. osyris waigeuensis* Joicey & Talb., *Ann. Mag. N. H.* (8). xx. p. 218 (1917) (Waigeu).

Both sexes resemble *H. angustata*, but have a large yellow ring on the upper-side of the hindwing. Forewing above in ♂ with a diffuse yellowish band in which the veins are not blackened ; the white area of hindwing in ♂♀ as in *H. angustata* extending to the costal margin and exteriorly strongly angulate. On underside the white band of forewing in ♂♀ reaching hindmargin ; the metallic rings of hindwing touch each other in ♂♀.

Waigeu.

The type, which my colleague, Monsieur F. Le Cerf, has had the great kindness to submit to me for inspection, is a ♀ without abdomen.

b. *H. osyris serapis* Grose-Smith (1894).

H. serapis Staud., Grose-Smith, *Nov. Zool.* i. p. 364. sub no. 161 (1894) (Dutch N. Guinea) ; id., *Ann. Mag. N. H.* (6). xx. p. 516 (1897).

H. isis isias Fruhst., l.c. (Kapaur).

H. isis busiris Fruhst., l.c. (Misol).

Fruhstorfer does not say in what the specimens from Kapaur and Misol differ from one another ; he compares *busiris* (from Misol) only with forms from which it is easily distinguished and avoids a comparison with *isias* from Kapaur. I do not find any reliable differences, and therefore place both Fruhstorferian names as synonyms under the older name *serapis*, which Grose-Smith was the first to publish. This author says, under *H. osyris*, l.c. : " Dr. Staudinger has named the specimens from German New Guinea *H. isis*, and a slightly different form, rather larger and blacker, from Dutch New Guinea, he calls *H. serapis*." The few words by which *H. serapis* is here described as a larger and blacker form characterise at the same time "*H. isis*" as a smaller and paler race. Though it would have been preferable if Grose-Smith had taken no notice of the names under which Standinger had sold these insects, the names are published with a sort of diagnosis and must therefore be accepted as dating from 1894. The diagnosis, short as it is, characterises the forms in question at least as well as do the Fruhstorferian descriptions. The specimens mentioned by Grose-Smith as being in the Tring Museum are from Ati-Ati-Onin (= *serapis*) and Constantinhafen (= *isis*).

♂. Forewing above without white band ; white area of hindwing almost as in *H. angustata*, ocellus with yellowish ring. On underside the white band of the forewing much broader than in *H. angustata*, entering far into cell, the lower cell-angle being placed in the white band, hindmargin of forewing brown-black.

♀. The white band of the forewing, above and below, extends forward at least to the lower cell-angle and penetrates deeper into the cell than even in *H. arca* ; the anterior ocellus often indicated above.

Misol ; Kapaur and Ati-Ati on the Onin Peninsula, and in the coast districts south of Geelvink Bay.

c. *H. osyris lepida* subsp. nov.

Hypocista (?) *isis* Fruhst., Rothsch., *Lepid. Brit. Ornith. Exp. Snow Mts.* p. 14. no. 56 (1915) (Oetakwa R.).

White band of forewing and white area of hindwing narrower than in the previous forms of *H. osyris*, the projecting angle of the area of the hindwing more obtuse, the ocellus of the upperside smaller, not so close to the white area.

♂. Forewing above with three diffuse white patches from lower cell-angle to (SM¹) ; median area of hindwing pure white, narrow, 5 mm. wide at the hindmargin of the cell, much narrower than the brownish black terminal area measured across the middle of the ocellus ; the yellowish ring somewhat darkened, separated from the white area by a line which is more than 1 mm. broad. On underside the white area of forewing enters the cell (the lower cell-angle within the white area), becomes narrower posteriorly and terminates far from the hindmargin, usually at the submedian fold.

♀. As in *H. o. serapis*, but the white band of the forewing posteriorly somewhat narrower ; the white area of the hindwing likewise narrower, much more obtusely angulate, the ocellus (as in ♂) smaller and more widely separated from the white area.

Setekwa R. and Oetakwa R., Dutch S.W. New Guinea, from sea-level to about 800 m., a series (Meek, Wollaston).

B. Underside of forewing with yellowish hairs at the base of the costal margin or costal vein ; the white area of the hindwing above not shaded with black at the abdominal margin.

d. *H. osyris pelagia* Fruhst. (1911).

H. osyris Boisdu., Grose-Smith, l.c. (Humboldt Bay).

In ♂♀ the projecting angle of the white area of the hindwing vestigial.

♂. Forewing above with a diffuse white band behind cell as in *H. o. lepida* ; white area of hindwing narrower from hindmargin of cell to costal margin than in any other subspecies in which the area remains white at the abdominal margin, 2.5 to 3.5 mm. broad at hindmargin of cell, strongly widened towards abdominal margin ; ocellus (as also in ♀) as far away from the white area as in *H. o. lepida*. On underside the white band of the forewing narrowing anteriorly and reaching posteriorly only to SM².

♀. White area of forewing triangular, narrowing costad, barely reaching the lower cell-angle, penetrating slightly into the cell or not at all, being much narrower between M¹ and M² than the black-brown terminal border ; on the hindwing the white area 5 mm. broad at the hindmargin of the cell. On underside the white band of the forewing enters the cell very slightly, being 3 mm. broad at the lower cell-angle and widening posteriorly.

North coast of Dutch New Guinea east of Geelvink Bay : Humboldt Bay (W. Doherty).

e. **H. osyris isis** Grose-Smith (1894).

H. isis Staud., Grose-Smith, l.c. (1894) (German N. G.); id., *Ann. Mag. N. H.* (6). xx. p. 576 (1897); Hagen, *Jahrb. Nass. Ver. Naturk.* L. p. 76. no. 90 (1897) (Stefansort and Simbang); Fruhst., l.c. (1911) (German N. G.).

H. isis senona Fruhst., l.c. (1911) (German N.G.).

I cannot distinguish *senona* from *isis*; Fruhstorfer avoids to mention a difference.—Very similar to *H. o. pelagia*, the white area of hindwing broader, above and below with a more distinctly projecting angle, above at hindmargin of cell 5 mm. broad in ♂, 5–6 mm. in ♀.

Astrolabe Bay and Huon Gulf.

C. Forewing beneath with yellow hairs at the base of the costal margin; the white area of hindwing more or less suffused with blackish brown from abdominal margin forward (on Aru occur specimens with the area not suffused with brown); yellowish ring of ocellus, on upperside, as in *H. o. osyris* broadly separated from the white area.—These are the forms which Fruhstorfer deals with under the specific names of *H. osyris* and *H. hathor*.

f. **H. osyris hathor** Fruhst. (1911).

♂. White band of forewing shines through from below as a yellowish grey vestigial band; white area of hindwing reaching backwards a little below the cell, the projecting angle sharply marked. On underside the band of the forewing narrowing anteriorly, continued costad a little beyond the lower cell-angle, penetrating very slightly into the cell and reaching the hindmargin of the wing.

♀. White band of forewing enters the cell slightly, extends forward to M^1 and is as broad at M^2 as the black terminal band; on the hindwing the white area reaches backwards to the submedian fold.

N.E. British New Guinea: Kumusi R., type in Mus. Tring; Hydrographer Range; and between Holnicote Bay and Owen Stanley Range (Meek, Eichhorn).

g. **H. osyris calypso** Grose-Smith (1897).

Hypocista (!) *calypso* Grose-Smith, *Ann. Mag. N. H.* (6). xx. p. 516 (1897) (Samarai and Tupulamu, Brit. N. G.).

H. osyris nephthys Fruhst., l.c. (1911) (Milne Bay; Aroa R.).

H. osyris frenus Fruhst., l.c. (1911) (Aroa R., above 2,000 m.).

♂. White area of hindwing above with a yellowish suffusion and usually somewhat smaller than in *H. o. hathor*; as a rule the blackish brown marginal band penetrates into the apex of the cell, the boundary of the whitish area is more diffuse on the distal side than in *hathor* and the projecting angle less sharp.

♀. Hardly distinguishable from *hathor* with certainty; the white area of the hindwing above not quite reaching to the submedian fold.

South-East New Guinea: Samarai, Milne Bay, Aroa R., Brown R., from sea-level up to about 2,000 m.

h. **H. osyris aruana** subsp. nov.

H. osyris Boisd., Felder, *Wien. Ent. Monats.* iv. p. 242. no. 88. tab. 3. fig. 5 ♂ (1860) (Aru; fig. mala); Ribbe, *Iris* i. p. 82 (1886) (Aru); Staud., *Exot. Tagg.* p. 231. tab. 83 ♂ (1887) (Aru).

H. osyris osyris Boisd., Fruhst., l.c. p. 296 (1911) (Aru).

♂. In the ♂♂ of *H. o. calypso* and *H. o. hathor* the veins of the hindwing above appear as dark lines; this is not the case in *H. o. aruana*. Forewing

on upperside with diffuse indication of a white band in which the veins appear as sharp black lines; the white area of the hindwing extends to the costal margin and either is small, rounded, suffused with brown, and reaches to the hindmargin of cell (type), or is purer white and broader and extends to the abdominal margin (with intergradations). On underside the median area suffused with brown on both wings of the dark form, sometimes the white colour almost suppressed; in the light-coloured form purer white, on the forewing hardly at all narrowed from M^2 forward.

♀. In the ♀ corresponding with the dark ♂ the white area of the forewing above distinct up to R^2 , not entering the cell; on the hindwing this area suffused with brown from the hindmargin of the cell to the abdominal margin, sometimes also in the cell. On underside the median area suffused with brown either on both wings or only on the forewing. In the light-coloured ♀ (of which we have one specimen only) the dark suffusion is hardly indicated, this ♀ agreeing almost exactly with the ♀♀ from N.E. New Guinea (*H. o. pelagia*), but the projecting angle of the median area of the hindwing is less sharp.

Aru Islands.

II. *Hyalodia* gen. nov.

Eyes almost as long-hairy as in *Platyphima*. In hindwing the lower cell-angle very obtuse, R^2 shorter (!) than R^3 , upper discocellular longer than in *Hypocysta*, not being much shorter than second.

Differs in markings from all other species dealt with in this paper in the hindwing bearing a large subapical ocellus which has two white pupils side by side, not one behind the other. The forewing is vitreous.

1. *Hyalodia tenuisquamosa* Joic. & Talb. (1922).

♂♀. *Hypocysta tenuisquamosa* Joicey & Talb., *Bull. Hill Mus.* i. p. 329. no. 5 (1922) (Weyland Mts., 300–1,100 m.).

♂♀. Forewing vitreous, with the exception of the margins, the scales small and most of them replaced by hairs. Hindwing much shorter in costal half than behind, the termen straight and oblique from apex to M^1 , obtusely rounded-angulate at M^1 ; from abdominal margin to near subcostal a large white area. On underside the posterior ocellus of hindwing smaller than the anterior one, with one white pupil, not two; the white area penetrates in between the ocelli towards the termen.

Dutch New Guinea: Weyland Mts., south of Geelvink Bay.

III. *Erycinidia* R. & J. (1905).

Eyes with very short hairs, appearing naked under a weak lens. Head long-hairy; end-segment of palpus porrect. Venation nearly as in *Hypocysta*: R^2 of forewing from below the angle of the cross-veins; R^2 of hindwing somewhat shorter than the cell. Hindwing triangular, with a lobiform tail at M^2 . ♂. Genitalia nearly as in *Hypocysta*, but the process of the anal tergite almost of even width to the tip, neither pointed nor dilated, simple, almost cylindrical, slightly compressed.

1. *Erycinidia gracilis* R. & J. (1905).

Upperside without white area. Only ♂♂ are known.

In the mountains of Southern and South-Eastern New Guinea : St. Joseph R. on the south side of the Owen Stanley Range, Mambare R. on the north-east side, and Rawlinson Mts., inland of the Huon Gulf.

2. *Erycinidia maudei* Joic. & Talb. (1916).

♂♀. *E. maudei* Joicey & Talb., *Ann. Mag. N. H.* (8). xvii. p. 74. no. 11. tab. 7. fig. 3 ♂ (1916) (Wandammen).

On upperside a large anteriorly rounded area on forewing and almost the whole hindwing white. Below only the forewing with a white area.

Dutch New Guinea : Wandammen, south of Geelvink Bay, about 1,800 m.

IV. *Pieridopsis* R. & J. (1905).

Very similar to the preceding genus : cell of hindwing only as long as R^3 , i.e. somewhat shorter than in *Erycinidia* ; tail shorter.—The discovery of *E. maudei* renders it probable that the slight difference between the two genera will be entirely wiped out by further new forms.

1. *Pieridopsis virgo* R. & J. (1905).

♂♀. A very variable species. Upperside for the greater part white, apex and distal margin of forewing, or more than half the wing, black ; a white costal spot at apical fourth. On underside, the white area of forewing connected with costa by means of two bands ; on hindwing an anteriorly forked, white, partly yellow-tinged, oblique band from costal margin towards the tail, which it does not reach, an abbreviated submarginal band also white. These markings often partly or almost totally suppressed ; cf. Joicey & Talbot, *Bull. Hill Mus.* i. p. 330. no. 7 (1922), who divide the species up into the following individual forms :

f. virgo R. & J. (1905), markings present.

f. obscurata Joic. & Talb. (1922), underside almost wholly black.

f. opaca iid. (1922), posterior half of the forked band of the hindwing below suppressed, the two branches not being connected.

f. infuscata iid. (1922), on upperside the white of the forewing not entering cell, beneath restricted to the hindmargin and separated from the two costal bands.

Dutch and British New Guinea : Weyland Mts., Snow Mts., St. Joseph R., Mambaré R.

V. *Platypthima* R. & J. (1905).

♂♀. Sexes similar. Eyes densely long-hairy. End-segment of palpus erect. Venation as in *Hypocysta* : SC^2 of forewing beyond cell, in some species from cell ; hindwing rounded, without tail, abdominal margin incurved near anal angle. ♂—genitalia different according to species, of similar build as in *Hypocysta*, but the lateral process (x. st.) of the anal segment usually short and broad, sometimes absent, rarely spiniform as in *Hypocysta*, clasper different in nearly all the species.

Only known from the mountains of New Guinea, one species extending to Goodenough Island.

We arrange the species in three groups :

A. Upperside white or yellowish white, at least on hindwing.

1. *Platypthima ornata* R. & J. (1905).

♂♀. *P. ornata* R. & J., *Nov. Zool.* xii. p. 458. no. 5 (1905) (Angabunga R.); Fruhst., in Seitz, *l.c.* p. 299. tab. 99 c. (1911).

♂♀. Upperside of hindwing with the exception of the termen bluish white, this colour extending on forewing to the base of M^1 and not reaching the costal margin. On underside the forewing without markings; hindwing with a sub-marginal row of ocelli bounded on the outer and inner sides by a metallic line, ocelli 4 and 5 black; at the basal side of the proximal metallic line from the abdominal margin to the middle of the wing or beyond a pale reddish brown band which becomes narrower anteriorly and is accompanied on the proximal side by a red-brown, posteriorly diffuse, band.

Only known from the south side of the Owen Stanley Range.

2. *Platypthima simplex* R. & J. (1905).

♂. Upperside almost exactly as in *P. ornata*. Beneath, the hindwing without the red-brown and yellowish white double band and the fifth ocellus black and larger than the others.

Only two ♂♂ known, collected by A. S. Meek at the same locality as the preceding species: Angabunga R., tributary of St. Joseph R.

3. *Platypthima placiva* spec. nov.

♂♀. Upper angle of cell of forewing more strongly produced than in the two previous species. Upperside dirty yellowish white, lighter in ♀ than in ♂; on forewing this area as large as in the preceding species, on the hindwing not reaching so far distad, posteriorly extended to the termen as a yellowish white powdering. Underside blackish brown, darker in ♂ than in ♀; on forewing at apex a rather indistinct terminal red-brown band, at the proximal side of which there is a trace of a band faintly paler than the ground and bounded each side by traces of a yellowish grey line; on the hindwing six small ocelli, the row starting at costa, the fifth black and larger than the others, in some ♂♂ also the third and fourth with a black iris; on inner and outer sides of the ocelli a bluish metallic line; at outer side of outer line a yellowish grey line at anal angle, sometimes still distinct further forward; then follow outward a dark line and yellowish grey one, both very thin, the termen towards costa narrowly red-brown, particularly in ♀. Anal tergite of ♂ gradually narrowing, dorsally carinate, spatulate; lateral process (x. st.) absent. Clasper broad at base, strongly narrowed in middle, apex strongly widened and on inside concave, apical margin with large teeth.

Length of forewing: 21–23 mm.

A number of ♂♂ and one ♀ (without abdomen) from the Hydrographer Mts. North-East British New Guinea, 700–800 m., i.–iv. 1908 (Eichhorn).

4. *Platypthima leucomelas* Rothsch. (1903).

♂. *Hypocysta leucomelas* Rothschild, *Nov. Zool.* x. p. 309. no. 1 (1903) (Aroa R.); Fruhst., *l.c.* p. 297 (1911).

Platypthima leucomelas Roths., Roths. and Jord., *l.c.* xii. p. 459. no. 7 (1905).

♂. Originally described from a single ♂ collected by Weiske. Mr. Talbot informs us that there is a specimen in coll. Fruhstorfer marked "Typus." This specimen was sent by us to Fruhstorfer and came from a series received by us after 1903. It is therefore neither the type nor a paratype.

Forewing dark, unicolorous. Hindwing above and beneath with a white area which is narrower costally. On hindwing beneath a row of ocelli, of which ocellus M¹-M² is very large, with deep black iris and a white dot as pupil; the metallic lines which bound the row of ocelli broad. Papillae of tongue long and numerous (almost as in *Harsiësis*). Median process of anal tergite narrow, lanceolate from middle; lateral process short, with parallel sides minutely dentate at the margin, the apical margin somewhat incurved, its upper angle produced as a tooth; clasper narrow, gradually widened towards base, with the apex spiniform, pointed.

British New Guinea, only ♂♂ known.

B. Upperside uniformly olivaceous brown and without ocelli on the hindwing. Underside with five or six ocelli on hindwing, forewing without ocelli. Upper cell-angle of forewing little further distal than lower angle.

5. *Platypthima homochroa* R. & J. (1907).

♂♀. *P. homochroa* Rothsch. & Jord., *D. Ent. Zeitschr.* p. 190. no. 1 (1907) (British New Guinea); *ibid.*, *Nov. Zool.* xv. p. 253. tab. 11. fig. 6 ♀ (1908).

Not mentioned in Seitz.—Upperside uniformly sepia brown. Underside little paler, on forewing a feeble trace of a pale submarginal band, 2 mm. broad, extending from costal margin to hindmargin and posteriorly approaching the termen; on hindwing a row of five small ocelli with black iris, 2 to 5 almost equal in size, 1 smaller, at costal margin a white dot and at anal angle a minute ocellus, at inner and outer sides of ocelli a metallic line, slightly purple. Process of anal tergite of ♂ long, thin, spiniform; lateral process (x. st.) broad, short, directed downward, divided into two spiniform prongs; clasper gradually but strongly narrowing from base to apex, which is smooth, very sharp, curved inward.

Three subspecies:

a. *P. homochroa homochroa* R. & J. (1907).

♂♀. Hindwing beneath on the basal side of the proximal metallic line rusty red in ♂, pale cinnamon in ♀; the diameter of the iris of the ocelli less than 1 mm.

North-Eastern British New Guinea: Biagi R. and Mambaré R., 1,500 m., iv. 1906 (A. S. Meek); one pair.

b. *P. homochroa satisbona* subsp. nov.

♂♀. Underside of hindwing much less bright-coloured on the basal side of the proximal metallic line; ocelli half as large again; x. st. and clasper somewhat narrower.

Island of Goodenough, between 700 and 1,200 m., iv. 1913 (A. S. Meek); one pair.

c. *P. homochroa euptychioides* Joic. & Talb. (1916).

P. euptychioides Joicey & Talb., *Ann. Mag. N. H.* (8). xvii. p. 75. no. 12. tab. 8. fig. 1 ♂ (1916) (Wandammen, 6,000 ft.).

♂. Underside of forewing with a narrow, distinct, reddish brown terminal band from apex to M¹, divided by a blackish subterminal line; proximal metallic line more regular, without lighter colouring at its proximal side; ocelli almost as in *satisbona*. Anal tergite broader; x. st. longer and narrower; clasper broader, more abruptly narrowing.

Dutch New Guinea: Wandammen Mts., south of Geelvink Bay, xi.-xii. 1920, about 1,800 m. (Pratt).

6. *Platyphthima dispar* Joic. & Talb. (1922).

P. dispar Joicey & Talb., *Bull. Hill Mus.* i. p. 329. no. 6 (1922) (Weyland Mts.).

♂♀. Upperside as in *P. homochroa*. Underside darker; hindwing with five ocelli, of which 1, 2 and 3 are very small, 4 is large and 5 at most half as large as 4. Anal tergite of ♂ lanceolate, apex not pointed; x. st. short, broad, denticulate at apex; clasper narrow from middle to apex, much narrower than in *P. homochroa*.

Two subspecies:

a. *P. dispar dispar* Joic. & Talb. (1922).

♂♀. A large form, length of forewing 21 mm. Outer margin of anal sternite (x. st.) of ♂ convex, inner margin concave, apex denticulate.

Dutch New Guinea: Weyland Mts., south of Geelvink Bay (Pratt).

b. *P. dispar huonis* subsp. nov.

♂♀. Length of forewing 19 mm. Underside slightly paler than in *P. d. dispar*, especially in ♀. Anal sternite (x. st.) on the outer side with a short, variable, denticulate projection or hump.

Eastern New Guinea: Rawlinson Mts., Huon Gulf (Keysser); five ♂♂, one ♀.

C. Above without white area, hindwing above with two ocelli, which are sometimes rather indistinct in those species which have a white or yellowish band on the underside. Upper cell-angle of forewing much more produced than lower angle, SC¹ usually from cell or from angle, lower cell-angle very obtuse.

7. *Platyphthima klossi* Rothsch. (1915).

♂♀. *P. klossi* Rothschild, *Lepid. Brit. Ornith. Exp. Snow Mts.* p. 14. no. 56a (1915) (Carstensz Peak).

♂♀. SM^a of forewing from beyond cell or from angle. In ♂♀ both ocelli of upperside of hindwing very distinct. Underside without white band, forewing without distinct ocelli, a brownish black discal band on outer side sharply bounded by a dull cinnamon band and scarcely extended to submedian fold, termen likewise brownish black, the dark discal band indicated on upperside. Hindwing beneath with five ocelli; from costal margin across apex of cell a brownish black band which narrows behind, costally at the outer side of this band a pale line, which is white in ♀. Clasper with a subapical, dorsal, short tooth.

Dutch South-West New Guinea: Carstensz Peak, between 1,500 and 3,000 m., ii.-iii. 1913 (Wollaston); two ♂♂, one ♀.

8. *Platyphthima decolor* R. & J. (1905).

♂. Forewing beneath with a narrow discal band suffused with yellow, and at apex some small ocelli. Hindwing, on underside, with a narrow, white median band which is forked from middle; four ocelli almost of equal size, with black iris, between first and second a vestige of another ocellus. Median process of anal tergite almost uniform in width, slightly spatulate, with the tip sharp; x. st. a long thin spiniform process; clasper narrow from middle to apex, before apex with long, dorsal, sharply pointed, triangular tooth.

British New Guinea, south side of Owen Stanley Range: Angabunga R., tributary of St. Joseph R., about 1,800 m. (Meek); one ♂.

9. *Platyphthima pandora* Joic. & Talb. (1916).

♂♀. *P. pandora* Joicey & Talb., *Ann. Mag. N. H.* (8). xvii. p. 75. no. 13. tab. 6. fig. 6 ♂ (1916) (Wandammen).

Underside of forewing with a whitish band suffused with yellow, widening behind; hindwing with a narrow, simple, irregular, white band; both bands shining through above. Four ocelli as in *P. decolor*. Genitalia of ♂ nearly as in *P. decolor*, but the dorsal tooth of the clasper is apical, not subapical, the apex of the clasper projecting a little beyond the base of the tooth.

Dutch New Guinea; two subspecies:

a. *P. pandora pandora* Joic. & Talb. (1916).

In ♂♀ the white median band of the hindwing, on underside, 1.5 mm. broad from costal margin to cell and 2 mm. in the cell. SM^a from cell-angle. Weyland Mts. and Wandammen.

b. *P. pandora goliathina* subsp. nov.

♀. Slightly larger, length of forewing 29 mm. The white band on underside of hindwing 1 mm. broad from costa to hindmargin of cell, quite thin below cell; ocelli larger, diameter of iris of first and of last ocellus 2.5 mm. SM^a from cell.

Mt. Goliath (about 130° L.), in Southern Dutch New Guinea; 1 ♀ (Meek).

10. *Platyphthima pedaloidina* Joic., Noak. & Talb. (1916).

♂♀. *P. pedaloidina* Joicey, Noak. & Talb. *Trans. Ent. Soc. Lond.* 1915. p. 366. no. 13. tab. 57. fig. 2 ♂, 3 ♀ (1916, June) (Arfak).

♂♀. As in *P. pandora* the light portions of the underside shining through above. Forewing beneath with a whitish band suffused with yellow as in *P. pandora*, but a broad branch runs from the band into or across the cell; on the hindwing five ocelli, not four, at the proximal side of them from costal margin to cell a white band which consists of narrow half-moons, this band continued backwards by red spots. ♂—genitalia essentially as in *P. pandora*. Arfak Mts. (Pratt).

VI. *Harsiësis* Fruhst. (1911).

♂♀. Similar to *Platyphthima*. Eyes long-hairy. Venation as in *P. decolor* and allies, SC² of forewing usually from cell, rarely from beyond cell. Outline of wings as in *Platyphthima*, but abdominal margin of hindwing less distinctly incurved; precostal curved outward, anguliform. Differs from all the genera dealt with in this article in the mid- and hindtibiae and -tarsi being spinose on the upperside. Papillae of tongue large and numerous. Anal tergite of ♂ long, thin, spiniform, curved downwards in an arch; lateral process of x. st. represented by an apically rounded hump; clasper gradually but strongly narrowed towards apex, with spiniform apex which is gradually curved inward.

Fruhstorfer's statement that the ♂ of *Harsiësis* differs from those of the allied genera in bearing three tufts of hairs on the hindwing is due to an error of observation. I cannot find these tufts.

New Guinea and Aru.

1. *Harsiësis hygea* Hew. (1863).

♂♀. Upperside without white band. On underside of hindwing below middle a large ocellus, the other ocelli very small.

Five subspecies:

a. *H. hygea tenebrica* subsp. nov.

Hypocysta hygea Hew., Butler, *Cat. Satyridae* p. 167. no. 1 (1868) (Aru); Ribbe, *Iris* i. p. 82. no. 49 (1886) (Aru).

Harsiësis hygea hygea Hew., Fruhst. (error determinationis), l.c. p. 299 (1911) (Aru).

♂. Upperside almost without a trace of the bluish grey tint found in all the forms from the western districts of New Guinea; on forewing a pale distal suffusion, quite rudimentary, extending to upper angle of cell; on underside this band likewise indicated, but is anteriorly narrower than above; the brown band of the hindwing, bearing the ocellus and bounded by the metallic lines, reaches to M², the third ocelliform dot (between R² and R³, in front of the large ocellus and in or at the brownish yellow ring) absent.

♀. Larger and paler than ♂, likewise without evident bluish grey tint. Aru Islands.

b. *H. hygea hygea* Hew. (1863).

Hypocista (!) *hygea* Hewitson, *Exot. Butt.* iii. *Hypoc.* figs. 2. 3 ♂ (1863) (New Guinea).

Hypocysta hygea Hew., Kirby, *Cat. Duirn. Lep.* p. 101 (1871) ("Aru" !); Oberth., *Ann. Mus. Civ. Genova* xv. p. 518 (1880) (Andai).

Harsiësis hygea subsp. ?, Fruhst., *l.c.* p. 299 (1911) (Andai).

Harsiësis hygea chalybe Joicey, Noak. and Talb., *Trans. Ent. Soc. Lond.* 1915, p. 367, no. 14 (1916) (Geelvink Bay).

♂♀. Upperside blue grey, the ♂ rather darker than the ♀. On underside the forewing with a feeble pale band in ♀, without it in ♂; the brown band bearing the ocellus on hindwing reaches to M^2 as in the preceding form, the third ocelliform dot placed in front of the ocellus distinct.

Dutch New Guinea: Dorey, Andai, Geelvink Bay, Onin Peninsula.

c. *H. hygea jobina* Fruhst. (1911).

Hypocista (!) *hygea* Hew., Kirsch, *Mith. Mus. Dresden* i. p. 119 (1877) (Ansus, Jobi).

Hypocysta hygea Hew., Staud., *Exot. Tagf.* p. 231 (1887) (Jobi); Grose-Smith, *Nov. Zool.* i. p. 364 (1894) (Jobi).

Harsiësis hygea jobina Fruhst., *l.c.* p. 299 (1911) (Jobi).

♂♀. Upperside with the blue-grey tint stronger than in *H. h. hygea*, especially in ♀. Underside of forewing from hindmargin forward with a diffuse pale band, which is abbreviated in ♂.

Island of Jobi.

d. *H. hygea noctula* Fruhst. (1911).

Hypocysta hygea Hew., Hagen, *Jahrb. Nass. Ver. Nat. L.* p. 76, no. 91 (1897) (pt., Stefansort); Grose-Smith, *Nov. Zool.* i. p. 364 (1894) (Humboldt Bay).

♂♀. *Harsiësis hygea noctula* Fruhst., *l.c.* (1911) (German N. Guinea).

According to information received from Mr. Talbot the type in coll. Fruhstorfer came from Friedrich Wilhelmshafen, Astrolabe Bay.

Similar to *H. h. hygea*, but the brown band which bears the ocellus extends below M^2 to SM^2 , as already pointed out by Messrs. Joicey & Talbot in their description of *H. h. chalybe* (cf. *H. h. hygea*, synonymy).

North coast of New Guinea: Humboldt Bay, Astrolabe Bay.

e. *H. hygea nigrita* subsp. nov.

Hypocysta hygea Hew., Hagen, *l.c.* (pt., Simbang).

♂♀. A small form, similar to Aru specimens. Much darker than *noctula*, the ♂♂ almost entirely without a blue-grey tint on the upperside, ♀♀ with a trace of it; forewing as in *H. h. tenebrica* with a diffuse pale band, which is narrower than in *tenebrica*; termen of hindwing narrowly pale brown, with a darker line, which is especially distinct in ♀. On underside, the forewing with a narrow diffuse band on disc, which is feeble in ♂, and rather prominent in ♀, and much narrower than in all the preceding forms; the band which bears the ocellus reaches to SM^2 as in *noctula*.

Eastern New Guinea: Rawlinson Mts. (type) and Simbang, a series; also one ♂ from Brown R., south side of Owen Stanley Range.

2. *Harsiësis yolanthe* Fruhst. (1911).

Harsiësis hygea yolanthe Fruhst., *Iris* xxvii. p. 137 (1913) (Eilanden R.).

Harsiësis pallidifascia Rothsch., *Lepid. Brit. Ornith. Exp. Snow Mts.* p. 15. no. 57 (1915) (Utakwa R.).

♂♀. Above, the ♂ brownish black, the ♀ pale brown, both sexes without blue-grey tint; forewing above and beneath with white discal band. The band of hindwing bearing the ocellus extends to M^2 as in the western forms of *H. h. hygea*. ♂—genitalia as in *H. hygea*.—Perhaps Fruhstorfer was right in treating this insect as a form of *H. hygea*; it occurs just in that district of Dutch South-West New Guinea whence no form of *H. hygea* is known.

Dutch South-West New Guinea: Oetakwa, Setekwa and Eilanden R., and Mt. Goliath, from sea-level to about 1,500 m.

3. *Harsiësis hecaerge* Hew. (1863).

Hypocista (!) *hecaerge* Hewitson, *l.c.* fig. 4. 5 ♀ (1863) (New Guinea).

Harsiësis hecaerge Hew., Fruhst., *l.c.*

♀. Only a few ♀♀ are known. Forewing above and below with a diffuse pale band, which is more prominent than in *H. hygea*, without blue-grey tint. In front of and below the large ocellus a smaller ocellus with black iris, the ocelli variable in size; the brown band in which they are placed reaches to M^2 .

Dutch New Guinea: In Mus. Brit. one ♀, probably from Dorey; in Mus. Tring one ♀ from Kapaur, another from Etna Bay.

VII. *Argyronympha* Math. (1886).

Argyronympha Mathew, *Proc. Zool. Soc. Lond.* p. 346 (1886); Fruhst., *l.c.* p. 297 (1911).

I cannot understand why Fruhstorfer felt justified in stating that no scientific diagnosis of the genus had been published. The description given by Mathew is detailed and far from bad, and has the great advantage over Fruhstorfer's description in Seitz that it contains no misleading statements.

The genus is easily recognised by the venation, the markings and the ♂-genitalia. Eyes with short hairs. Tibiae and tarsi without spines on upper-side; apex of foretarsus of ♀ dilated, right and left with more than one tuft of sensory hairs. In forewing the upper cell-angle obtuse, not produced (as it is in all the previous genera), upper discocellular longer than in the preceding genera, second with a shallow curve, third oblique, no deep angle at or near the point of origin of R^2 , SC^2 from cell; hindwing somewhat longer in anterior half than in posterior (in *Hypocysta* the inverse is the case), therefore the cell only a little over half the length of the wing, cross-vein 2 much shorter than 3 (in *Hypocysta* cross-vein 2 much longer than 3), 3 about as long as 1 and 2 together, oblique, lower cell-angle less than 90° , abdominal margin not incurved.

♂-genitalia: segment 8 very long, ventrally with a thick truncate tuft of long and narrow scales. Anal tergite compressed, its apex dilated in a vertical sense, the vertical margin with an upper and a lower projection (often reduced) and a median hook; at each side of it, but further ventral, two very long, narrow sclerites, which widen towards base and are much longer than the anal tergite, projecting straight backwards; the upper sclerite corresponds to the spiniform x. st. of *Hypocysta*; it is naked, without bristles, apically widened and asymmetrically forked, the upper prong being quite short and the lower one long

and pointed. The second, lower, lateral sclerite is the clasper, it is feebly chitinated, green (as are also the palpi in most forms), almost straight, narrowed apically, longitudinally impressed on the outerside, with a longitudinal ridge on innerside, ventrally with numerous bristles, on outerside with thin marginal bristles, which are partly very long in the first two species. Penis-sheath apically on inside and at the margin densely studded with small sharp teeth, the membranous portion minutely spinose.

Mathew described two species; I select *A. ugiensis* as genotype.

The genus is confined to the Solomon Islands.

1. *Argyronympha pulchra* Math. (1886).

♂♀. *A. pulchra* Mathew, *l.c.* p. 347. tab. 34. fig. 4 ♀ (1886) (Treasury); Ribbe, *Iris* xi. p. 107 (1898); Fruhst., *l.c.* p. 298 (1911) (partim).

A very variable species. According to Ribbe, *l.c.*, a dark form occurs together with a brighter coloured one, which statement is borne out by our material, at least as regards some of the islands.

Foretarsus of ♂ strongly inflated, without spiniform tip. Forewing above with or without red-brown or orange area; hindwing basally scarcely paler than terminally. Underside of both wings whitish grey from base to the brown discal band. Anal tergite of ♂ at the vertical apical margin with an upper and a lower short tooth and between them a more strongly projecting hook.

On the main chain of islands, not yet known from Maleya.

a. *A. pulchra laeta* subsp. nov.

A. pulchra Math., Ribbe, *l.c.* (partim).

♂♀. Basal half of forewing, above, brighter orange than in the brightest specimens of the following subspecies, this area extends to the lower cell-angle, but the apex of the cell remains black, the orange area appearing incurved below the costal margin, the outer margin of the area usually crosses M^2 beyond its middle. Underside of forewing with a light orange tint along the brown discal band.

Bougainville.—Meek stayed on the island twice for some time and found only this bright-coloured form, which he obtained in numbers, and no black-brown specimens. Fruhstorfer apparently had not seen specimens from Bougainville.

b. *A. pulchra pulchra* Math. (1886).

A. pulchra Math., *l.c.* (Treasury).

A. ulava Grose-Smith, Ribbe (error determinationis), *l.c.* (1898) (= *pulchra*).

A. pulchra adustata Fruhst., *l.c.* (Choiseul).

A. pulchra argentaria Fruhst., *l.c.* (Ysabel).

A. pulchra denya Fruhst., *l.c.* (Shortland).

♂♀. Dimorphic. Forewing, above, with or without orange-tawny area. In all the specimens I have seen the orange-tawny patch is smaller than in *A. p. laeta*, more rounded and darker, frequently almost entirely suppressed. I have tried to find reliable differences between the specimens from the various islands, but have failed to discover any. The bright-coloured specimens from Ysabel, for instance, are not distinguishable from bright-coloured ones from

Shortland, and dark specimens from Shortland cannot be separated from similarly coloured examples from other islands. If one wishes to distinguish between dark and bright individuals, *f. adustata* should be employed for the former and *f. pulchra* for the latter. Meek has nowhere found both forms at the same time. Are the differences, at least to some extent, seasonal?

2. *Argyronympha gracilipes* spec. nov.

♂♀. Foretarsus and -tibia of ♂ not swollen, thin, hardly thicker than the forefemur, tarsus without spiniform tip. Forewing, above, in ♂♀ from the base to M¹ dark tawny ochraceous, darker than the brightest specimens of *A. p. pulchra*; basal half of hindwing with distinct though feeble traces of an ochraceous tint. On underside the dark brown discal band of the forewing broader than in *A. pulchra*, much less sharply defined, the whole basal half of the forewing with a clayish ochraceous tint, not whitish grey as in *A. pulchra*, slightly greyer on hindwing than on forewing; as in *A. pulchra* the anterior black macula of the hindwing bears a yellowish white double spot. ♂-genitalia as in *A. pulchra*.

Guadalcanar (Meek, Woodford); a series.

3. *Argyronympha rubianensis* Grose-Smith (1889).

♂♀. Foretibia and -tarsus of ♂ slightly swollen, tarsus acuminate, with brownish spiniform tip. Forewing, on upperside, orange-ochraceous, with black terminal band, the orange area at least extended to lower cell-angle, this colour also distinct on hindwing from base to middle, but distally diffuse and fading away. On underside the forewing brighter or duller ochraceous tawny, the reddish brown discal colouring diffuse, posteriorly sometimes more band-like, but this band narrow; on the hindwing the basal area grey or dark tawny, in the anterior macula a quadrangular transverse yellowish white spot, below which there is at most a trace of a second spot. The upper tooth, but especially the lower one, of the apical margin of the anal tergite of ♂ much larger than in *A. pulchra* and *A. gracilipes*, and the marginal bristles of the clasper much thinner and shorter.

Western group of islands of the Solomons, in several subspecies.

a. *A. rubianensis rubianensis* Grose-Smith (1889).

A. rubianensis Grose-Smith, *Ent. Mo. Mag.* xxv. p. 299 (1889) (Rubiana); id. & Kirby, *Rhop. Exot.* ii., *Satyr. Argyr.* p. 4. figs. 4, 5 ♂ (1895); Ribbe, *l.c.* (partim); Fruhst., *l.c.*

♂♀. Foretarsus of ♂ distinctly swollen. The orange-ochraceous area of forewing, above, as bright as in *A. p. laeta*, but much larger, the black terminal band widened basad at hindmargin (reaching to middle in ♂), also vein M¹ in outer portion of orange area more or less black. On underside the reddish brown colouring at the proximal side of the yellowish white submarginal line narrow from hindmargin to about R¹, band-like, thence extended to apex of cell.

Rubiana (= New Georgia) and Kulambangra.

b. *A. rubianensis rendova* Fruhst. (1911).

♂♀. Foretarsus of ♂ not at all swollen. Upperside of wings somewhat paler orange than in the previous form, the black terminal band posteriorly less widened, and therefore the outer margin of the orange area less oblique.

Rendova.

c. *A. rubianensis guizona* Fruhst. (1911).

♂♀. Foretarsus of ♂ as in *A. r. rendova*. The orange area of forewing occupies the whole of the cell and extends a little beyond, the cross-veins being black bars within the orange area, outer margin of this area straight, not indented at the veins, the black terminal band almost of even breadth from R' backwards, not dilated at hindmargin. On underside the brown discal colouring of the forewing rather more extended than in the two previous races.

Guizo.

d. *A. rubianensis vella* Fruhst. (1911).

A. rubianensis Grose-Smith, Ribbe, l.c. (Renonga ;—this subspec. ?).

♂♀. The orange area of the forewing, above, deeper tawny and also somewhat smaller. On underside the reddish brown colouring of the disc of forewing much more extended ; the hindwing likewise darker and its brown discal stripe broad.

Vella Lavella, the most northern of the larger islands of the New Georgia group ; and Renonga ?

4. *Argyronympha ulava* Grose-Smith (1889).

♂♀. *A. ulava* Grose-Smith, *Ent. Mo. Mag.* xxv. p. 299 (1889) (*Ulava*) ; id. & Kirby, *Rhop. Exot.* ii., *Satyr. Argyr.* p. 4. figs. 6. 7 ♀ (1895) ; Ribbe, *Iris* xi. p. 107 (1898) (= *pulchra*, errore). *A. pulchra uleva* (!) Grose-Smith, Fruhst., l.c. (1911).

♂♀. Larger than the other species, forewing narrower, 24 to 26 mm. long. Forewing, above, in ♂ with a dull tawny area from near base to well beyond lower cell-angle, in ♀ this area faintly indicated. Underside of both wings a greyish clay-colour, the ground of the distal area less contrasting with the proximal area than in *A. pulchra* ; brown discal band of forewing much narrower than in *A. pulchra* and a much duller brown ; on hindwing the anterior black macula different, divided by a dull white band into a proximal spot which is almost square and sharply defined, and a distal band of four contiguous spots ; black portion of posterior macula also smaller than in *A. pulchra*. Apex of anal tergite of ♂ strongly produced downward, the hook close to lowest point, dorsal portion of apical margin rounded, not projecting as a distinct tooth, almost exactly as in *A. ugiensis*, to which *A. ulava* comes nearest in spite of the difference in the colouring of the uppersides. Foretibia and -tarsus not swollen, tarsus slightly brown at tip, but not spiniform.

Ulava Island, near Maleyta.—This species, no doubt, occurs also on Maleyta.

5. *Argyronympha ugiensis* Math. (1886).

♂♀. *A. ugiensis* Mathew, *Proc. Zool. Soc. Lond.* p. 347. tab. 34. fig. 3 ♂ (1886) (Ugi).

A. ugiensis yanuta Fruhst., *l.c.* (1911) (S. Christoval;—type at Tring).

♂♀. Foretibia and -tarsus of ♂ strongly swollen, tarsus truncate, without terminal spine. In both sexes the orange ochraceous area of the upperside even larger than in *A. rubianensis*, almost the whole hindwing being of this colour. On underside, the short proximal metallic stripe is absent on the forewing and the yellowish white submarginal line is at most vestigial; on the hindwing the posterior macula is without black, the anterior macula reduced and divided up by a yellowish white cross and a streak emanating from the cross between R^1 and R^2 . Apex of anal tergite of ♂ less high than in *A. pulchra* and *A. rubianensis*, the upper tooth absent, the ventral one indicated only as a short round hump immediately below the strongly projecting hook; marginal bristles of clasper short and thin.

Southern Solomons: Ugi and San Christoval.

TWO NEW SUBSPECIES OF SPHINGIDAE

By DR. KARL JORDAN.

1. *Megacorma obliqua remota* subsp. nov.

♂♀. Upperside of forewing more olivaceous on the light-coloured parts; below the black stripe which runs from costal margin across apex of cell to distal margin there is a black elongate patch between M^1 and M^2 , more or less distinctly joined to the stripe at or near lower cell-angle; the black patch in middle of termen joins the stripe in all five specimens before me, this being also the case in two Ceram ♀♀, but not in any of our six specimens from New Guinea and thirteen from Sumatra, India and Ceylon.

Genitalia as in Malayan specimens, except that the teeth which the harpe bears on the inner surface below the uppermost marginal tooth are rather larger.

Hab. Solomon and Bismarck Islands.

In Mus. Tring 4 ♂♂ from: Arawa, Bougainville, December 1907, type; Vella Lavella, February—March 1908; Guizo, 1904; New Hanover, March 1923; all obtained on A. S. Meek's expeditions.

In coll. B. Preston Clark a ♀ from Bougainville.

The specimen from New Britain recorded by Pagenstecher (cf. R. & J., Revision of Sphingidae, p. 16) probably also belongs here.

2. *Sesia clavipes eumelas* subsp. nov.

♀. Deep black, head and thorax above greenish, on underside the palpi white, the breast cream-colour, sharply contrasting with abdomen, which is not grey at base and has no grey median line, but is much shaded with ochraceous. Tail all black, with very little brown in it. Hindtarsus brownish black; base of hindwing beneath like breast. Fringes of both wings brownish black. Forewing, above, with a faint green tint on a very deep black ground, pale median band purplish, on disc a row of four white spots, 1, 3 and 4 minute, transverse, 2 larger, very little longer than broad. Foretarsus clavate.

Length of forewing: 31 mm., breadth 12.5 mm.

A large form, from Malvern, Jamaica, one ♀.

In the Revision *S. clavipes* was described as a subspecies of *S. tantalus*. We have since come to the conclusion that the specimens with clavate foretarsus represent a distinct species.

SOME NOTES ON THE *FREGATIDAE*

By DR. PERCY R. LOWE.

(Plates XXII and XXIII.)

A RECENT attempt to determine two species of Frigate-bird which had been taken on Scott's last journey to the South Pole and a subsequent perusal of the literature of the group convinced me that in spite of the splendid work done by Mathews and Rothschild, there was still room for a few remarks upon the family by way, if possible, of rendering clearer the points which differentiate the various species one from another or of attempting to seize upon the true facts in a controversy in which these two authorities were at variance.¹ For although the progress made by them since Volume XXVI of the *Catalogue of Birds of the British Museum* was written in 1898 bears ample testimony to the thoroughness of present-day systematists, it would appear on that very account to call for some notice and grateful recognition.

In Volume XXVI of the publication just referred to, Ogilvie-Grant recognised two species only of the *Fregatidae*, viz. *Fregata aquila* (Linné) and *Fregata ariel* (Gould), and this roughly represented at that period the conception most naturalists had formed, both at home and in the field, in regard to the composition of what was in reality by no means so homogeneous or simple a group. It must be noted, however, that a year before Grant's contribution in Volume XXVI appeared, Ridgway, in an account of the Birds of the Galapagos Archipelago,² had described both *F. aquila aquila* and *F. aquila minor* as occurring on those islands, and incidentally he pointed out that Gould's *Attagen ariel* had nothing whatever to do with Gmelin's *Pelecanus minor*. Here, then, was a confession of faith in at least three forms; and it might have been expected that such a hint would have been followed up; but it was not until Mathews monographed the genus *Fregata* in the fourth volume of his *Birds of Australia* in 1915 that any attempt was made to do this or any impartial unbiased expression of opinion on the species and subspecies of the genus written.

Mr. Mathews' remarks occupy fifty-four pages of his book, and as usual his researches into the literature of the subject are exhaustive. The final result of his work, after revision subsequent to Lord Rothschild's criticism, to be presently referred to, was to convince him of the existence of five species as follows:

- Fregata aquila* (Linné), Ascension Island.
- F. magnificens* Mathews, Galapagos Islands.
- F. andrewsi* Mathews, Christmas Island, Indian Ocean.
- F. minor minor* (Gmelin), West Indies.
- F. m. nicolli* Mathews, South Atlantic Ocean.
- F. m. aldabrensis* Mathews, Western Indian Ocean.
- F. m. listeri* Mathews, Eastern Indian Ocean and North Australia.
- F. m. palmerstoni* (Gmelin), South Pacific Ocean.
- F. m. ridgwayi* Mathews, Galapagos Islands.
- F. ariel* and subspecies.

¹ Cf. *Birds of Australia*, vol. iv, and Nov. Zool. vol. xxii.

² *Proc. U.S. Nat. Mus.* vol. xix. 1897, pp. 590-592.

Fine as this piece of work was, an unfortunate error of judgment was made, in our opinion, in fixing upon Jamaica as the type locality of Gmelin's *Pelecanus minor*; for this to a large extent affected the conclusions he arrived at and vitiated the results of a splendid piece of research.

Lord Rothschild,¹ in some criticisms of Mathews' conclusions, was quick to see and to point out that not only was he not justified in arbitrarily fixing Jamaica as the type locality but that the bird found in Jamaica and the Caribbean basin, to say nothing of the Atlantic and Mexican Gulf, was not Gmelin's *P. minor* at all, but belonged to an entirely different species. Previous to this criticism, Mathews had regarded his newly described *F. magnificens* from the Galapagos as a subspecies of *F. minor*.² In his paper (loc. cit.) Rothschild points out that the *F. magnificens* of the Galapagos and the West Indian and Mexican Gulf Frigate-birds are specifically identical.

As a result of a careful revision of the genus founded upon the birds contained in the British Museum collection and the splendid series at Tring, which Lord Rothschild kindly allowed me to examine, including Mr. Mathews' collection, I have arrived at the conclusion that there can be little doubt that in the two points made in his paper (loc. cit.) Lord Rothschild was right and that Mr. Mathews was at fault.

Gmelin's name, *Pelecanus minor*, was given to Brisson's description of a bird which was based upon Edwards' *Gleanings of Natural History* Pt. ii. 1760, p. 209, but, as was pointed out by Rothschild (loc. cit.), the bird in Edwards' plate, an obvious female, has the throat and foreneck white, whereas in all West Indian birds the female has the throat and foreneck black. In the fine series of female Frigate-birds which I have examined from the Caribbean and Mexican Gulf basins this black throat is not only constant but it is very conspicuous, and in sharp contrast to the throat of *F. minor*. In the adult female the black of the throat comes well down the neck and ends in a blunt point (cf. fig.). In the species *F. minor* it is not strictly correct to speak of the *white* throat. The shafts of each feather are dusky, and the vanes of the feathers are also somewhat "smutty" so that the throat has a *mottled* or *smoky* appearance (cf. pl. xxii).

No West Indian adult female of *F. magnificens* could by any possibility be mistaken for an adult female of *F. minor*; nor do I think it likely that immature examples of these two distinct species could be confused; for nestling and immature birds from the Indian and Pacific Oceans invariably (as far as I have been able to ascertain) exhibit a tinge of rusty in greater or less proportion on some portion of the head, neck or breast.

I have visited various Frigate-bird "rookeries" during the breeding season in the Caribbean basin (Caymans, Swan Island, Testigos, Hermanos), and I have never seen an immature specimen nor a nestling which exhibited this rusty "stain," nor is there one in our series of skins in the British Museum. A rusty "stain" is diagnostic of the Indian or Pacific Ocean, with the one exception that it is found in immature Frigate-birds taken on South Trinidad (*F. minor nicolli*); but this exception only accentuates the truth of the statement just made, for this South Trinidad colony is an obvious extension into the South Atlantic from the Indian Ocean and as obviously belongs to the *minor* group.

¹ Nov. Zool. xxii. 1915, pp. 145-146.

² Austr. Av. Rec. vol. ii. 1914, p. 120.

I have made a point of this because the head or neck of the bird depicted in Edwards' drawing exhibits a rusty tone, and to my mind this might possibly be an indication that the bird was derived from the East and not the West.

Lord Rothschild, in his paper, expresses the opinion that "there is considerable internal evidence in the text (Edwards'), besides the fact of the white throat, which proves that the bird received by Edwards came from the Eastern half of the Indian Ocean, so I must fix as the typical *Fregata minor* of Gmelin the birds of that area."

The only internal evidence which I can find in Edwards' text of the bird having come from the Indian Ocean is contained in the last sentence, which reads: "I suppose this (the bird figured) may be the female bird; for since I drew it I have been told *by a gentleman who has made several voyages to the East Indies* (italics mine) that the feathers of the males of this species are wholly black."

This evidence, which of course is only suggestive, is, however, when taken in conjunction with the evidence of the "white" throat and the rusty head, strongly indicative to my mind that the bird in question hailed from the East.

Another point which strongly induces me to believe that Edwards' bird came from the East is the mere fact that it was called *minor*, for male examples from Christmas Island and that immediate quarter of the Indian Ocean are obviously smaller than male examples of the Frigate-bird from the western hemisphere (cf. measurements below, under *F. minor minor* and *F. magnificens rothschildi*), or even from examples of the *F. minor* group from other quarters of the Indian or Pacific Ocean.

So small would the male of *F. minor*, from the amended typical region, appear to be that when I first attempted the task of reducing our series to order I found it by no means easy to differentiate between young males of *minor* and young males of *ariel*. This diminutive size of typical *minor* may, I think, be the true explanation as to why this species had for so long remained unrecognised as an entity distinct from *F. aquila* and *F. ariel*; for, strange to say, neither the barring on the wing in the adult male *minor* nor the very conspicuous difference in the throat of the female had been recognised in the past.

As regards the second important error made by Mathews, but corrected by him (cf. list given above) after it had been pointed out by Rothschild (l.c.), viz. that of making his *F. magnificens* a subspecies of *F. minor*, I have convinced myself beyond any question of doubt that however difficult it may have been to extract or define *F. minor* from *F. ariel* or the true *F. aquila*, or other shadowy forms, there can be no doubt whatever that *F. magnificens* is a perfectly distinct species, characterised by quite conspicuous characters and occupying a definite geographical area.

It is all the more surprising that although Mathews had the perspicuity to resurrect *F. minor* from the tomb to which it had been consigned by unobservant workers, yet he obviously seems to have missed noting the complete distinction which exists between *F. magnificens* and the *F. minor* group. Thus, although at first sight a comparison of Mathews' final list of species with that of Rothschild's (given in NOVITATES ZOOLOGICAE) does not reveal any very obvious differences, yet in reality there was a fundamental difference in the two conceptions of the group.

My object in making these remarks is, in point of fact, to endeavour to

make it more clear that Rothschild's conception was the right one. I believe, moreover, these notes are all the more justified and called for from the fact that Mr. W. L. Slater, in a fine work (*Systema Avium Ethiopicarum*) which purports to be an international attempt to lay down an authoritative exposition on the systematic status of the birds of the entire world, has, in that part devoted to the Ethiopian Region, very unfortunately and without reserve entirely accepted Mathews' conception of the group.

ANNOTATED LIST OF THE SPECIES OF THE GENUS "FREGATA"

1. *Fregata aquila*.

Pelecanus aquilus Linn., *Syst. Nat.* 10th ed. p. 133, 1758. Ascension Island, Atlantic.

Pelecanus leucocephalus Gmelin, *Syst. Nat.* i. pt. ii. p. 572.

We are indebted to Mathews for having, preliminary to any other work, satisfactorily pinned down the type species of the genus to Ascension Island. As far as is known at present *F. aquila* breeds on no other island, but it would be interesting to know what form occupies Fernando Noronha.

It seems likely, however, that this type species is really an abnormal variety confined to Ascension, possibly a melanistic phase that has established itself on the island to the exclusion of the normally coloured form; but it is not so clear what the real affinities of this dark phase may be. I am strongly inclined to think that *F. aquila*, as now restricted, belongs properly to the *ariel* group; my reasons for thinking so being that in the female, beneath the dark pigment, can still be seen the light nuchal collar and the light breast of the female *F. ariel*. Moreover, the "white thumb marks," regarded as diagnostic, on the flanks of *F. ariel* are either adumbrated or repeated in the white under-down seen in the same situation in *F. aquila*. An additional reason may be quoted in the small bill, the absence of a bar on the wing and the small size of the bird in general.

Nevertheless, I would not take the logical course which such a view would indicate, viz. to regard *F. ariel* as a subspecies of *F. aquila*, because in *F. aquila* both male and female are characterised by no bar on the wing, and in this are unique among Frigate-birds, while in addition the female has the lanceolate iridescent mantle feathers characteristic of the male instead of the dull hastate feathers normally characteristic of the female throughout the genus. Thus *F. aquila*, in spite of its apparent affinity with the *ariel* group, is sufficiently distinct, in a specific sense, to save the situation. Finally, I might add that although stated to be a melanic variation, it is to be noted that the nestlings in down and immature show no indication of melanism whatever. It is also to be noted that the gloss of the green mantle feathers in *F. aquila* differs in colour and technique from that in *F. ariel*.

Specimens examined:

♂ ad., Ascension Island, December 1877 (Dr. F. Penrose, B. M. Coll.).
Bill, 113 mm.

♂ ad., Ascension Island, no date (I. Noble, B. M. Coll.). Bill, 113 mm.

♂ ad., Ascension Island, no date (I. Noble, B. M. Coll.). Bill, 113 mm.

♂ ad., "Malacca" (fide A.O.H., B. M. Coll.). Bill, 113 mm.

♀ ad., Ascension Island, Challenger Expedition, B. M. Coll.. Bill, 124 mm.

Immature. Ascension Island, Challenger Expedition, B. M. Coll.

Immature, Ascension Island, Challenger Expedition, B. M. Coll.

Juv. (fledgling), Ascension Island (Dr. F. Penrose, B. M. Coll.).

It is to be noted that nestlings and immature examples in the white-headed phase exhibit no trace of the "rusty" feathers so characteristic in the young of *F. minor* or *F. ariel*.

2. *Fregata magnificens magnificens*.

Fregata minor magnificens Mathews, *Austr. Avian Rec.*, vol. ii. 1914. p. 120. Barrington Island, Galapagos Archipelago.

Fregata magnificens Rothschild, *Nov. Zool.*, vol. xxii. 1915. p. 146.

Fregata magnificens Math., *Birds of Australia*, vol. iv. p. 280. Galapagos Islands.

As I have already stated, *F. magnificens* is a perfectly good species, easily recognised and sharply defined from either *F. aquila* or *F. minor*.

The *adult male* has no bar on the wing (in which it is like *F. aquila* or *F. ariel*); it is "all black" above and below, with greenish-purple head feathers and iridescent purple mantle and scapular feathers.

The purple back and absence of wing-bar are diagnostic.

The *adult female* has a conspicuous wing-bar extending the whole length of the cubit, while the throat, foreneck and a pointed gorget are black (cf. PL. XXII); the breast is white; the abdomen, crissum, and under tail-coverts are black; the top of the head purplish; mantle and scapulars purplish-brown (feathers not lanceolate); rump purplish-brown or greenish. There is a distinct whitish collar on the back of the neck: in a mounted specimen of *F. m. rothschildi* from Florida in the British Museum this is nearly as distinct as in females of *F. ariel*, and is well indicated in all our specimens from the West Indian area.

Immature have the head, neck and throat white *with no trace of rusty*.

Whether *F. m. magnificens* is entirely confined to the Galapagos remains to be seen when much more material is available. Two birds from Jalisco (Mexico) in the Tring Collection and one from California in the British Museum appear to be indistinguishable from typical examples from the Tring Collection.

Specimens examined:

Fregata magnificens magnificens.

♂ ad., Albemarle Island, Galapagos, 8. ix. 1900, Tring Coll.

♂ ad., Barrington Island, Galapagos, 8. vii. 1891, Tring Coll. Bill, 127 mm.

♂ ad., Indefatigable Island, Galapagos, viii. 1891, Tring Coll.

♂ ad., Jalisco, Mexico, 30. iv. 1892, Tring Coll. Bill, 129 mm.

♂ ad., Santa Clara, S. Francisco (Capt. Kellet), B. M. Coll. Bill, 124 mm.

♀ ad., Wenman Island, 8. iv. 1897, Tring Coll.

♀ ad., Jalisco, Mexico, 31. iv. 1892, Tring Coll.

(Bills measured from angle of gape to tip.)

F. magnificens rothschildi.

F. minor rothschildi Math., *Birds of Australia*, vol. iv. 1915. p. 280. Aruba, Dutch West Indies.

F. minor minor Math., *Birds of Australia*, vol. iv. 1915. pp. 265 and 280. West Indian Seas.

F. magnificens Rothschild, *Nov. Zool.* vol. xxii. 1915. p. 145. Coasts and Islands of America.

In spite of Rothschild's critical paper (see above), Mathews, in his monograph on the Frigate-birds, persistently clung to his original opinion that the bird

met with in the Caribbean basin and adjacent countries is Gmelin's *F. minor*. I have given my reasons above for thinking this is not the case, but whatever the bird may be it is absolutely certain that it is specifically identical with the bird which Ridgway described as *F. aquila* in his account of the Birds of the Galapagos (*Proc. U.S. Nat. Mus.* 1897, vol. xix. p. 590), which Mathews subsequently named *F. minor magnificens* (l.c.), and which Lord Rothschild and the writer recognise as a distinct species, *F. magnificens*.

I have examined a fine series of adult and immature Frigate-birds (see below) from the Bahamas, Florida, West Indian Islands (including Jamaica), Dutch West Indies, Yucatan, Mexico, Guatemala, Honduras, Panama, Trinidad, Brazil and Peru. All these have either the barless wing and brilliant purple backs of the male *F. magnificens* or the black throat of the female (except when immature). From the point of view of distribution or the study of genetics they are, for me, *F. magnificens*, but I should be quite prepared to believe that if large series were carefully measured and compared with typical examples from the Galapagos, differences might be found and subspecies established. It goes without saying that an isolated colony in say the Bahamas will not breed true to the same index figure as one in the Dutch West Indies or another in the Galapagos. At present our series, while representative of a widespread Neotropical and Atlantic area, are not nearly large enough as regards any given locality.

This reference to the Atlantic area brings me to another point.

In his monograph in the *Birds of Australia*, vol. iv, Mathews, having rightly restricted *F. aquila* to Ascension Island, goes on to remark of Gmelin's *F. minor*: "This is the name to be used for the world-wide bird commonly known as *Fregata aquila*." Neither *F. minor* nor *F. magnificens* are world-wide in distribution, but when Mathews wrote the above he was under the impression that he had one species to deal with, whereas there were still two distinct species left after setting on one side *F. aquila*, *ariel* and *andrewsi*. Moreover, my impression is that it was *F. magnificens* far more than the real *F. minor* that used to be confounded with *F. aquila*. The true *F. minor* has only just emerged, if indeed it actually has, from the shadowy land of vagueness where it consorted formerly with *F. ariel*, but, with the exception of South Trinidad we can now, with absolute precision, restrict its distribution to the Indian Ocean and to the Pacific. It sends a feeler into the South Atlantic in the case of South Trinidad and reaches its farthest eastern limit in the Galapagos, where it breeds side by side with *F. magnificens*. This latter species, on the other hand, may be described as having a distribution which is restricted to the coasts and seas of tropical America with an extension eastwards to the Cape Verde Island group and Gambia. One may hazard a surmise that its original home of evolution was the Caribbean basin and Mexican Gulf.

Merely judging from the scanty material available, it is interesting to note that the birds which occupy the most eastern extension of the area of distribution of *F. magnificens* are strikingly larger than West Indian examples; thus, the bills of a female from Gambia in the B. M. Collection measures 151 mm., that of a male from the Cape Verde Islands 142 mm. Possibly this is due to the much larger proportion of surface food round and between the islands than is met with round West Indian islands.

Specimens examined :

Fregata magnificens rothschildi.

- ♂ ad., Abaco, Bahamas, 30.ii.1902 (Bonhote, B. M. Coll.). Bill, 128 mm.
 ♂ ad., Abaco, Bahamas, 30.ii.1902 (Bonhote, B. M. Coll.). Bill, 123 mm.
 ♂ ad., Abaco, Bahamas, 30.ii.1902 (Bonhote, B. M. Coll.). Bill, 132 mm.
 ♂ ad., Punta Rassa, Florida, 19.v.1886 (Scott, B. M. Coll.). Bill, 123 mm.
 ♂ ad., Little Cayman Island, 20.iv.1886 (Maynard, B. M. Coll.). Bill, 121 mm.
 ♂ ad., British Guiana (McConnell, B. M. Coll.). Bill, 129 mm.
 ♂ ad., Kingston, Jamaica, April 1905 (Wray, B. M. Coll.). Bill, 125 mm.
 ♂ ad., Belize, Honduras, May 1862 (Salvin, B. M. Coll.). Bill, 135 mm.
 ♂ ad., Trinidad, March 1903 (P. R. Lowe, B. M. Coll.). Bill, 118 mm.
 ♂ ad., Cape Sable, Florida, Jan. 1914 (Tring Coll.). Bill, 120 mm.
 ♂ ad., Everglades, Florida, 1.x.1914 (Tring Coll.). Bill, 116 mm.
 ♂ ad., Pointe Guarde, Trinidad, 6.i.1903 (Tring Coll.).
 ♂ ad., Aruba, D.W.I., 3.vii.1892 (E. Hartert, Tring Coll.). Bill, 128 mm.
 (Type of *rothschildi*.)
 ♂ ad., Antigua, W.I., 20.x.1903 (Tring Coll.). Bill, 122 mm.
 ♂ ad., Barbuda, W.I., 13.x.1903 (Tring Coll.). Bill, 123 mm.
 ♂ ad., Rio Janeiro, Brazil, 2.i.1818 (Natterer) (Tring Coll.). Bill, 125 mm.
 ♂ ad., Rio Janeiro, Brazil (Capt. Milner), B. M. Coll. (mounted). Bill, 128 mm.
 ♀ ad., Florida (Salvin & Godman), mounted, B. M. Coll. Bill, 142 mm.
 ♀ ad., Tarpon Springs, Florida, 27.vii.1886 (Scott, B. M. Coll.). Bill, 138 mm.
 ♀ ad., Punta Rassa, Florida, 18.v.1886 (Scott, B. M. Coll.). Bill, 134 mm.
 ♀ ad., Bahia, Brazil (Salvin & Godman, B. M. Coll.). Bill, 147 mm.
 ♀ ad., Champerico, Guatemala (Salvin, B. M. Coll.). Bill, 137 mm.
 ♀ ad., Turneff Lagoon, B. Honduras (Salvin, B. M. Coll.). Bill, 143 mm.
 ♀ ad., Little Cayman Island, 14.iii.1904 (Nicoll, B. M. Coll.). Bill, 143 mm.
 ♀ ad., St. Vincent, W.I., 15.v.1890 (Smith, B. M. Coll.). Bill, 141 mm.
 ♀ ad., Panama (Capt. Kellet & Lt. Wood, B. M. Coll.). Bill, 137 mm.
 ♀ ad., North America (H.R.H. Duke of Sussex, B. M. Coll.). Bill, 134 mm.
 ♀ ad., Aruba, Dutch W.I., 3.vii.1892 (E. Hartert, Tring Coll.).
 ♀ ad., Aruba, Dutch W.I., 3.vii.1892 (E. Hartert, Tring Coll.).
 ♂ imm., Payta, Peru, Jan. 1882 (Salvin & Godman, B. M. Coll.).
 No sex, imm., Payta, Peru, Jan. 1882 (Salvin & Godman, B. M. Coll.).
 No sex, imm., Alcabuco, S. Bahia, Brazil, 18.vi.1904 (McBarnet, B. M. Coll.).
 No sex, imm., Rio Janeiro, Brazil (Capt. Milner, B. M. Coll.).
 No sex, imm., Cozumel, Yucatan, Jan. 1886 (Gaumer, B. M. Coll.).
 No sex, imm., Belize, British Honduras, 2.v.1862 (Salvin, B. M. Coll.).
 No sex, imm., Tamaulipas, Mexico, 1888 (Richardson, B. M. Coll.).

¹ This specimen agrees with other S. American examples in having the mantle typical of *F. magnificens*.

² This specimen has the feathers of the back brownish with very faint purplish reflections—feathers not lanceolate. There is a conspicuous white nuchal collar almost as in *ariel*, which is also quite obvious in all our females from the *Caribbean*.

3. *Fregata andrewsi*.

Fregata andrewsi Math., *Austr. Av. Rec.*, vol. ii. 1914. p. 120. Christmas Island, Indian Ocean.

This species occupies as isolated a position as *F. aquila*, having so far been found breeding nowhere else than in its topotypical home. The adult male is unique in having a white abdomen. The female has the whole of the underparts white, with the exception of the throat and foreneck, which are black. In the male the foreneck and entire pectoral region are also black with purplish reflections. In both sexes the wings are conspicuously barred.

It may be worth noting that the colour-pattern arrangement in the adult male as regards the abdominal and pectoral regions is juvenal or reminiscent of that to be noted in the immature of *F. minor*, *ariel* and *magnificens*.

Specimens examined :

♂ ad. (Type), Flying Fish Cove, Christmas Island (Andrews), Tring Coll. Bill, 127 mm.

♂ ad., Flying Fish Cove, Christmas Island (Andrews), B. M. Coll. Bill, 130 mm.

♂ ad., Flying Fish Cove, Christmas Island (Andrews), B. M. Coll. Bill, 128 mm.

♀ ad., Flying Fish Cove, Christmas Island (Andrews), B. M. Coll. Bill, 144 mm.

♀ ad. (Type), Flying Fish Cove, Christmas Island (Andrews), Tring Coll. Bill, 155 mm.

♂ (? ♀) imm., Cocos Keeling (Wood Jones), Tring Coll. Bill, 137 mm.

♀ juv., Christmas Island, Indian Ocean, B. M. Coll. Bill, 124 mm.

♀ imm. (white head), Celebes, C. Hose, B. M. Coll. Bill, 144 mm.

The female type has somewhat lanceolate dorsal plumes which are iridescent green with bluish or purple edges. It is larger in its bill measurement than any bird I have examined, not excluding the very large female from Gambia in the British Museum.

Fregata minor minor.

Pelecanus minor Gmelin, *Syst. Nat.* p. 572. 1789. Eastern half of the Indian Ocean (by Desig.—cf. Rothschild, *Nov. Zool.* vol. xxii. 1915. p. 145).

Fregata minor listeri Math., *Austr. Av. Rec.* vol. ii. 1914. p. 119.

I have already given my reasons above for thinking that Rothschild was right in fixing the type locality of Gmelin's bird in the East instead of in the West Indies (Jamaica) as had been done by Mathews. The eastern half of the Indian Ocean embracing a wide area, I would suggest Christmas Island, Indian Ocean, where the bird breeds, as the *terra typica*.

In the light of the fine work done by Iredale, Mathews and Rothschild on this genus, it is easy enough to express surprise that the older systematists were so very indiscriminating, and that more species than *F. aquila* and *ariel* were not recognised; for what could be in sharper contrast than the almost black throat with V-shaped gorget seen in the female *F. magnificens* and the pale, smoky, faintly mottled throat of the female *F. minor*, with its truncated hinder border not at all continued backwards on to the upper breast as in the V-shaped manner of *F. magnificens*, *ariel* or *andrewsi*. I have pointed this out to Lord Rothschild, and he has kindly supplied cuts to illustrate the point.

There is only one certain adult male of *F. m. minor* from Christmas Island in the B. M. Coll. : its bill (measured from the closed gape) measures 113.5 mm., as compared with 130 mm. in the male of *F. andrewsi*, also found breeding on the island, or 113 mm. in four male examples of *F. aquila*, or 126 mm. in eight males of *F. magnificens* taken at random. Two males of the latter species measured as much as 135 mm. (one of them was not included in the above average). A young male from the island of Diego-Garcia (Indian Ocean) which I have determined as *F. minor* has a bill measurement of 108 mm. This is the exact size of the bill in a single specimen from Huaheiné (Pacific). If birds from this latter locality are eventually found to differ from true *F. minor*, then they must bear the name of *F. m. palmerstoni*.

Similarly, birds from Laysan, of which Lord Rothschild has a fine series at Tring, will be known as *F. m. strumosa* Hartert; while those from the Mascarenes as *F. m. aldabrensis* Math. In the British Museum we have a very fine series of the *minor* group from South Trinidad, on which the name of *F. m. nicolli* has been bestowed by Mathews, and finally in the Galapagos we meet with *F. m. ridgwayi* Math. This latter subspecies breeds side by side with *F. magnificens* in the Galapagos Archipelago. In his newly published book on this group of islands Beebe describes and figures *F. m. ridgwayi* under the name *F. aquila*. I mention it because the fact that one can easily appreciate his mistake goes to prove how, even in a popular description, it is, in the light of recent work, easy to discriminate *F. m. ridgwayi* from *F. magnificens*, and both, of course, from *F. aquila*.

In the *minor* group both adult male and female have "barred" wings and the male has the mantle feathers some shade of iridescent green as opposed to iridescent purple in *F. magnificens*. The differences in the throat coloration have already been mentioned.

Immature in the white-headed stage have the head, neck and breast tinged with rusty feathers, which serves to distinguish them from *F. magnificens* or *F. aquila*.

Fregata minor aldabrensis.

There is in the British Museum Collection a female Frigate-bird from Ceylon with the typical mottled grey throat of the *minor* group and a bill measurement of 136 mm. (wings and tail deficient). This measurement is about the average of females from South Trinidad. No other examples have been recorded from Ceylon as far as I am aware. Possibly this bird straggled from the Mascarenes. At any rate I have referred it for the present to the form which occurs in that group.

Birds of the *Fregata minor* group examined are as follows :

Fregata minor minor.

♂ ad., Christmas Island, Indian Ocean, August 1897 (Andrews). Bill, 113.5 mm.

♂ imm., Flying Fish Cove, Christmas Island (Andrews, B. M. Coll.), Nov. 1897. Bill, 114 mm.

♂ imm., Diego-Garcia, Sept. 29, 1885 (Penrose, B. M. Coll.). Bill, 107 mm.

♂ ad., Type of *F. m. listeri*, Tring Coll. Bill, 108 mm.

- ♂ ad., Huaheiné (Pacific), B. M. Coll. Bill, 132 mm.
 ♀ ad., Type of *F. m. listeri*, Tring Coll.
 ♀ ad., Luang Island (S.W. Islands), H. Kühn, Tring Coll. Bill, 130 mm.
 ♀ ad., Manggoer (S.E. Islands), H. Kühn, Tring Coll. Bill, 132 mm.

Fregata minor aldabrensis.

- ♂ ad., Aldabra, Nov. 1906 (B. M. Coll.). Bill, 129 mm.
 ♂ ad., Seychelles (Shelley Coll., B. M. Coll.). Bill, 116 mm.
 ♂ ad., Glorioso, March 1906 (M. J. Nicoll, B. M. Coll.). Bill, 122 mm.
 ♂ ad., Aldabra, 23. vii. 1906 (Tring Coll.). Bill, 120 mm.
 ♂ ad. (type), Aldabra, 23. vii. 1906 (Tring Coll.). Bill, 122 mm.
 ♂ ad., *En plein mer* (Seychelles), 20. xii. 1904 (Tring Coll.). Bill, 117 mm.
 ♂ ad., *En plein mer* (Seychelles), 20. xii. 1904 (Tring Coll.). Bill, 129 mm.
 ♂ ad., *En plein mer* (Seychelles), 20. xii. 1904 (Tring Coll.). Bill, 130 mm.
 ♂ ad., *En plein mer* (Seychelles), 20. xii. 1904 (Tring Coll.). Bill, 121 mm.
 ♂ ad., *En plein mer* (Seychelles), 20. xii. 1904 (Tring Coll.). Bill, 121 mm.
¹ ♀ ad., Ile Aride, Seychelles, 15. xii. 1904 (Tring Coll.). Bill, 135 mm.
¹ ♀ ad., Ile Aride, Seychelles, 15. xii. 1904 (Tring Coll.). Bill, 142 mm.
 ♀ ad., Ile Aride, Seychelles, 17. xii. 1904 (Tring Coll.). Bill, 131 mm.
 ♀ ad., Ile Aride, Seychelles, 18. xii. 1904 (Tring Coll.). Bill, 130 mm.
 ♀ ad., Ile Aride, Seychelles, 29. viii. 1905 (Tring Coll.). Bill, 140 mm.
 ♀ ad., Aldabra, 25. viii. 1906 (Tring Coll.). Bill, 150 mm.
 ♀ imm., Aldabra. Bill, 142 mm.
 ♀ ad., Aldabra, Nov. 1906 (B. M. Coll.). Bill, 141 mm.
 ♀ imm., Seychelles (Shelley Coll., B. M. Coll.). Bill, 130 mm.

Fregata minor strumosa.

- ♂ ad., Laysan, 29. vii. 1896 (Tring Coll.). Bill, 125 mm.
 ♂ ad., Laysan (Palmer), (Tring Coll.). Bill, 125 mm.
 ♂ imm., Laysan, 7. viii. 1896 (Tring Coll.). Bill, 125 mm.
 ♂ imm., Laysan, 7. viii. 1896 (Tring Coll.). Bill, 123 mm.
 ♀ ad., Laysan (Palmer) (Tring Coll.). Bill, 137 mm.
 ♀ ad., Laysan (Sch.), 21. vii. 1896 (Tring Coll.). Bill, 137 mm.
 ♀ ad., Laysan (Sch.), 29. vii. 1896 (Tring Coll.). Bill, 139 mm.
 ♀ ad., Laysan (Palmer) (Tring Coll.). Bill, 130 mm.
 ♀ ad., Laysan (Sch.), 29. vii. 1896 (Tring Coll.). Bill, 139 mm.
 Imm., Samoa, 78. 1. 19. 108 (Whitmee, B. M. Coll.).

Fregata minor ridgwayi.

- ♂ ad., Wenman (Tring Coll.). Bill, 111 mm.
 ♂ ad., Wenman, 2. xi. 1901 (R. N. B.) (Tring Coll.). Bill, 108 mm.
 ♂ ad., Culpepper, July 1897 (Harris) (Tring Coll.). Bill, 110 mm.
 ♂ ad., Culpepper, 27. vii. 1897 (Harris) (Tring Coll.). Bill, 106 mm.
 ♀ ad., Culpepper, 29. vii. 1897 (Harris) (Tring Coll.). Bill, 128 mm.

The dorsal plumes of these males are of a brilliant coppery green.

¹ Evidently very old females, as the mantle feathers had developed quite a conspicuous purplish-green gloss.

Fregata minor nicolli.

♂ ad. (not fully), South Trinidad, 29.x.1913 (Stammwitz, B. M. Coll.). Bill, 116 mm.

♂ ad., South Trinidad, 29.x.1913 (Stammwitz, B. M. Coll.). Bill, 112 mm.

♀ ad., South Trinidad, 29.x.1913 (Stammwitz, B. M. Coll.). Bill, 137 mm.

♀ ad. (brown head), South Trinidad, 29.x.1913 (Stammwitz, B. M. Coll.). Bill, 127 mm.

♀ ad. (brown head), South Trinidad, 4.i.1906 (Nicoll, B. M. Coll.). Bill, 145 mm.

♀ ad., South Trinidad, 4.i.1906 (Nicoll, B. M. Coll.). Bill, 135 mm.

♀ ad., South Trinidad, 4.i.1906 (Nicoll, B. M. Coll.). Bill, 144 mm.

♀ imm. (white head), South Trinidad, 4.i.1906 (Nicoll, B. M. Coll.). Bill, 137 mm.

♀ imm., South Trinidad, 4.i.1906 (Nicoll, B. M. Coll.). Bill, 137 mm.

♀ imm., South Trinidad, 4.i.1906 (Nicoll, B. M. Coll.). Bill, 136 mm.

♂ imm., South Trinidad, 4.i.1906 (Nicoll, B. M. Coll.). Bill, 114 mm.

♂ imm., South Trinidad, 4.i.1906 (Nicoll, B. M. Coll.). Bill, 122 mm.

♂ imm., South Trinidad, 4.i.1906 (Nicoll, B. M. Coll.). Bill, 123 mm.

♂ imm., South Trinidad, 4.i.1906 (Nicoll, B. M. Coll.). Bill, 128 mm.

♂ imm. (white head), South Trinidad, 29.x.1913 (B. M. Coll.). Bill, 128 mm.

If the sexing is correct, it is difficult to reconcile some of the measurements of the immature males.

F. minor mathewsi subsp. nov.

Mathews, in his *Birds of Australia*, has, I think, given rather scant justice to the Australian material he examined. There are in the British Museum Collection two adult males, one adult female, two immature birds, and one quite young bird, still showing down, from Queensland or Torres Straits. Lord Rothschild and I have compared these with the male specimen from Christmas Island, and we find that throughout the series (young and old, and in both sexes) the wing barring is not continued so far back as in *F. m. minor* and occupies a rather different position.

It is evident, therefore, that the Queensland Frigate-bird can be distinguished from the typical form, and I propose to call it *F. m. mathewsi*, in honour of Mr. G. M. Mathews.

Type ad. ♀, Gould Collection, Raine Island, in B. M. Coll., 81.5.1.6150.

I append the following bill measurements:

(1) ad. ♂, Queensland (Salvin & Godman Coll., B. M. Coll.), 81.11.7.163. Bill, 116 mm.

(2) ad. ♂, Queensland (Salvin & Godman Coll., B. M. Coll.), 81.11.7.165. Bill, 119 mm.

(3) ad. ♀ (type), Raine Island (Gould, B. M. Coll.), 81.5.1.6150. Bill, 138 mm.

(4) imm. ♂, Oomaga, Torres Straits (Macgillivray, B. M. Coll.) Bill, 115 mm.

(5) imm. (showing down), Raine Island (Challenger, B. M. Coll.). Bill, 112 mm.

(6) ♂, (?) Queensland (Salvin & Godman Coll., B. M. Coll.). Bill, 112 mm.

Fregata ariel.

Gray, *Genera Birds*, vol. iii. p. 669. pl. 183. 1845. Raine Island, North Australia.

"The material in the British Museum is so scanty that it precludes the idea of reviewing this species and its subspecies with any useful result. There are, however, three specimens from South Trinidad (two of which have been referred to already by Mathews, l.c., p. 286) which are remarkable enough to be worth specially noting.

All three are labelled as males, and even the most adult is not fully adult. This latter was a bird taken on Lord Cranford's visit by Nicoll, which still has conspicuously barred wings and the breast and abdomen white, mottled with black (adult black feathers coming through). Otherwise this bird is an obviously adult male with greenish-purple lanceolate vertex feathers and purplish-green, not nearly so lanceolate, mantle feathers.

The other two specimens were taken on Antarctic expeditions and were both labelled males by E. A. Wilson. *Both have brown heads* and both have the white of the flanks running well back into the axilla. One bird taken in July 1910 has a smoky brown throat and foreneck and worn light brown mantle feathers. Through these latter new purplish feathers are appearing, but they are not lanceolate. The wings and tail have been freshly moulted, except the coverts forming the light wing bar, which are worn. The other bird taken in Sept. 1901 (Discovery) has a throat which is somewhat smoky, as in a female *F. minor*; foreneck and breast white, and some black feathers coming in over the lower end of the breast as in the normal adult female *ariel*. The mantle feathers are very suggestive of an adult female *ariel*.

I am inclined to think the first bird is a young male, but that the other may be a young female, but, whatever they are, the brown head phase is either peculiar to the South Trinidad *ariel* or it so happens that this phase has never been noted or collected before throughout the whole range of the species. It is remarkable that throughout all the species of the genus I have not come across another brown-headed bird except in a fine female example of *F. minor nicolli* taken on South Trinidad on Jan. 4th, 1907, by Mr. Nicoll. This bird and the ? female example of *ariel* just described are very much alike, except that the bill of the former measures 146 mm. and the other 97 mm. (All three birds under discussion have the same bill measurement.)

Moreover, if it is possible to judge from a specimen in the white-headed phase taken from Christmas Island, other races of *F. ariel* moult straight from the white-headed state into the glossy purple. This Christmas Island specimen also seems to indicate that the white-headed phase with rusty streaking lasts more than one year at least, for new rusty feathers are "coming in" in quill amidst old faded ones. I am inclined to think that it takes several years for a Frigate-bird to assume fully adult plumage, for in the case of *F. magnificens rothschildi* I found, in the Caribbean basin, many white-headed birds actually nesting and have photographs of them on the nest. However, whatever the sequences may ultimately prove to be, there is some justification for thinking that a brown phase may be peculiar to South Trinidad, and I am proposing to mark the fact by calling this island race

Fregata ariel wilsoni subsp. nov.

Type in Brit. Mus., ♂ Juv., 28.vii.1910, S. Trinidad Island. E. A. W., Brit. Ant. Exp. 1910.

Since the above was written Lord Rothschild has kindly allowed me to examine his splendid series not only of *F. ariel*, but of the whole genus.

There is, in addition to the above three interesting birds, in the B. M. Coll. an example of a young rusty-headed male *F. ariel* from Somaliland (ex coll. S. R. Clarke), and I have seen another from the same country (off Zeyla) in the collection of Sir Geoffrey Archer. I have provisionally referred these birds to the race from the Mascarene Islands, named by Mathews *F. ariel iredalei*, but I think it is unlikely, as has been suggested, that these birds had wandered from the Mascarenes, but rather that there is some Arabian colony of which they were members, for in my actual experience Frigate-birds are as much tied to the islands or rocks of their breeding haunts as Petrels and are quite local in their distribution. They may make journeys of sixty, a hundred or two hundred miles or more from their breeding place, but I think it will be found that they always return to it, and that journeys or wanderings of nine hundred or a thousand miles are not undertaken.

Specimens examined :

Fregata ariel ariel.

- ♂ ad., Bedout Island (Tunny), 24.v.1901 (Tring Coll.). Bill, 102 mm.
- ♂ ad., Bedout Island (Tunny), 20.v.1901 (Tring Coll.). Bill, 105 mm.
- ♂ ad., Bedout Island (Tunny), 20.v.1901 (Tring Coll.). Bill, 107 mm.
- ♂ ad., Little Key Islands (Kühn), 10.i.1898 (Tring Coll.). Bill, 107 mm.
- ♂ ad., Little Key Islands (Kühn), 11.vii.1898 (Tring Coll.). Bill, 98 mm.
- ♂ ad., Batchian (Platen), 7.xii.1892 (Tring Coll.). Bill, 97 mm.
- ♂ ad., Batchian (Platen), 24.iii.1893 (Tring Coll.). Bill, 97 mm.
- ♂ ad., Halmahera (Platen), Dec. 1902 (Tring Coll.). Bill, 97 mm.
- ♂ ad., Small Island, N. Australia, August 1893 (Tring Coll.). Bill, 106 mm.
- ♂ ad., West Beach, Lord Howe Island, 11.ii.1915 (Tring Coll.). Bill, 105 mm.
- ♂ ad., Kangean Island, Java (Prillwitz), September — (Tring Coll.). Bill, 106 mm.
- ♂ ad., Kangean Island, Java (Prillwitz) (Tring Coll.). Bill, 105 mm.
- ♂ ad., Poa Ceram (Stresemann), 23.ix.1911 (Tring Coll.). Bill, 105 mm.
- ♂ imm., Jamdena Island, Tenimber (Kühn), 8.i.1907 (Tring Coll.). Bill, 105 mm.
- ♂ ad., Palawan (white head), 30.viii.1887 (Tring Coll.). Bill, 106 mm.
- ♂ ad., Ceram (A. R. Wallace), 1859 (Brit. Mus. Coll.). Bill, 106 mm.
- ♂ ad., Fiji Islands (Woodford) (Brit. Mus. Coll.). Bill, 105 mm.
- ♂ ad., Raine Island (Challenger) (Brit. Mus. Coll.). Bill, 102 mm.
- ♂ ad., Admiralty Island (Challenger) (Brit. Mus. Coll.). Bill, 104 mm.
- ♂ ad., N.W. coast, Australia (Capt. Chambers) (Brit. Mus. Coll.). Bill, 104 mm.
- ♂ ad., Bampton Shoals (Richards) (Brit. Mus. Coll.). Bill, 103 mm.
- ♂ ad., Cape York, N. Australia (Gould Coll.), mounted (Brit. Mus. Coll.). Bill, 95 mm.
- ♀ ad., Bedout Island (Tunny), 20.v.1901 (Tring Coll.). Bill, 108 mm.

- ♀ ad., Bedout Island (Tunny), 19.v.1901 (Tring Coll.). Bill, 108 mm.
 ♀ ad., Bedout Island (Tunny), 20.v.1901 (Tring Coll.). Bill, 107 mm.
 ♀ ad., Bedout Island, type of *F. a. tunneyi* (Tring Coll.). Bill, 107 mm.
 ♀ ad., Raine Island, 12.vii.1911 (Brit. Mus. Coll.). Bill, 106 mm.
 ♀ ad., Small Island, August 1893 (Brit. Mus. Coll.). Bill, 108 mm.
 ♀ imm., Labuan (white head), July 1893 (Ussher, Brit. Mus. Coll.). Bill, 106 mm.
 ♀ ad., Raine Island (Challenger) (Brit. Mus. Coll.) Bill, 103 mm.
 ♀ ad., Pt. Moresby (Goldie) (Brit. Mus. Coll.). Bill, 103 mm.
 ♀ ad., Woodie Wallis Island, Australia (Lord Derby) (Brit. Mus. Coll.). Bill, 103 mm.
 ♀ ad., Farquhar Islands (Saunders, B. M. Coll.), August 1895 (Brit. Mus. Coll.). Bill, 98 mm.
 ♀ ad., Raine Island (Challenger), mounted (Brit. Mus. Coll.). Bill, 110 mm.
 The last female in the above list is very dark above and has distinct purplish reflexions on the mantle feathers—which are not lanceolate. The male from Cape York has a purplish-blue back. It is noteworthy that females in the *ariel* group do not seem to be so large in relation to the male as in other groups.

Fregata ariel iredalei.

- ♂ ad., Aldabra (Mortimer), 1903 (Tring. Coll.). Bill, 90 mm.
 ♂ ad. (sexed ♀), Seychelles, 21.xii.1904 (Tring. Coll.). Bill, 96 mm.
 ♂ ad., Ile Aride, Seychelles, 29.viii.1905 (Tring. Coll.). Bill, 99 mm.
 ♂ ad., Comoro, 23.iii.1905 (Tring. Coll.). Bill, 97 mm.
 ♂ ad., Madagascar, 10.i.1891 (Tring. Coll.). Bill, 93 mm.
 ♀ ad., Aldabra (Thibault), 23.vii.1906 (Tring. Coll.). Bill, 102 mm.
 ♀ ad., Mauritius (Shelley Coll.) (Brit. Mus. Coll.). Bill, 100 mm.

Fregata ariel subsp.

- ♂ ad., Cocos Keeling, 22.v.1906 (Tring Coll.). Bill, 97 mm.
 ♀ ad., Cocos Keeling, 12.vii.1905 (Tring Coll.). Bill, 105 mm.

In the above account I have felt it to be unnecessary to describe the salient characters which distinguish *F. ariel*, and I have not attempted, even in spite of the material examined above, to dwell on the differences which characterise subspecies. Probably this will be done in the future when even more material is available.

Finally, I should like to proffer my sincere thanks to Lord Rothschild for his generous and unstinted assistance in preparing this paper.

(In addition to the specimens mentioned by Dr. Lowe in his list of material examined, there are at Tring the following specimens :

Fregata aquila Linn.

- 1 ♀ ad., Boatswain Island, Ascension Island, Jan. 4th, 1878 (David Gill, F.R.S.A., Coll.) ex coll. Rev. H. H. Slater.

***Fregata magnificens rothschildi* Math.**

- 1 ♂ ad., Antigua, W. Indies, 20.x.1903 (Selwyn Branch coll.); 2 ♂♂ ad., Barbuda, W. Indies, 13.x.1903 (Selwyn Branch coll.).
 1 ♂ ad., 1 ♂ juv., Key West, Florida, Nov. 1897 (J. M. Southurd coll.).
 1 ♀ imm., Gasparillo, Trinidad, 18.i.1903 (E. André Coll.).
 1 ♂ ad., Brazil, ex. coll. Mathews exchanged with British Museum.
 1 ♂ ad., Rio de Janeiro, Jan. 2, 1815, ex coll. Mathews.
 1 ♂ ad., Everglade, Florida, 10.i.1914; 1 ♂ ad., Cape Sable, Florida, Jan. 1914 (coll. L. Chastam); 1 ♂ ad., San Marco, 30.vi.1885 (E. C. G.), Florida.
 1 ♂ juv., Key West, Florida, Oct. 1906 (Batty Coll.).

***Fregata minor* subsp. (?)**

- 2 ?? juv., received frozen from New Zealand.
 1 ♂ juv., at sea off New Zealand, April 1913.

***Fregata minor aldabrensis* Math.**

- 7 Imm., Aldabra and Seychelles (Thibault Coll.).

***Fregata minor strumosa* Hart.**

- 4 Imm., 5 pull. various sizes, Laysan Island (Schauinsland Coll.).

***Fregata minor ridgwayi* Math.**

- 1 imm., Galapagos, Culpepper Island, July 1897 (Harris Coll.).

Although Dr. Lowe has purposely abstained from giving the diagnoses and differences of the various subspecies, I think the paper would be incomplete without my stating that the differences given by Mathews between West Indian *Fregata magnificens rothschildi* (which he persistently asserts is either true *minor* or a subspecies of it, whereas he finally admits his *minor magnificens* from the Galapagos Islands to specific rank) and the Galapagos *magnificens magnificens* are solely in the length of the tail; those of the West Indian birds and the few we have from the east coast of South America consistently show much shorter tails than the Galapagos birds.—ROTHSCHILD.)

A CORRECTION AND AN ADDITION TO "AN ORNITHOLOGICAL
VISIT TO N.W. MAROCCO" BY HUBERT LYNES, NOV.
ZOOLOG., XXXI, P. 49.

I. *Re p.* 59.—Further expert examination of our specimens of the Jebel Mago fir shows that the tree is not quite the true *Abies pinsapo* of Andalusia, but the very nearly allied *Abies maroccana* Trabut, described in *Bull. Soc. Bot.*, No. 53, 1906, as having leaves which differ in the position of their resin-bearing glands, and somewhat also in shape, from those of *A. pinsapo*.

It appears that in 1905 (at which date, of course, no part of the Rif was accessible to Europeans) M. Joly, finding in Tetuan some recently cut branches of a fir-tree, said by the native who brought them in to have come from the mountains above Chechauen (Xauen), sent a specimen to M. Trabut, who described it as above, pointing out that this new *Abies* stood just intermediate between *A. pinsapo* and the closely allied *A. numidica* de Lannoy, 1866, peculiar to the Babor Mountains (1,800 m. to 2,000 m.) of North Algeria.

M. Joly's specimen had no cones, nor, I regret to say, had the next specimens to come to Europe, viz. ours; for in April we could find nothing but fallen cones gnawed by apes or otherwise spoilt by insects and rot.

But I now think it quite likely that the different growth of the Rif trees, to which I drew attention, need not necessarily be ascribed to the Andalusian trees having been lopped for charcoal in early life, and that *A. maroccana* may be found to have this additional character of growth to distinguish it from *A. pinsapo*; and one, it may be said, more readily perceptible than those revealed by a microscopic study of the leaves. Needless to add, it is very desirable that some cones of the Rif tree should be collected and submitted to expert botanical examination. Autumn would probably be the best season to collect them.

II. *Re pp.* 97-98.—I have recently myself travelled through this territory of Es Sahel; true, only by automobile, but that has been enough to strengthen the provisional conclusions, based on the latest evidence about woodlands there. There are certainly no "forests" in any of this western part of Yebala. Coming up from the south by the auto road, on crossing the Ouad Luccus at Alcazarquebir, Spanish (Yebala) territory begins in wide open plains and marsh land, then come small dry hills and hillocks, probably of no ornithological note, except that they enclose patches of swamp with thick flag and sedge growth, not unlikely ground for Crakes, Savi's Warbler, *Motacilla flava*, etc. Elsewhere, in summer, it is all very dry, only scrub, no trees (save the cultivated kinds in occasional gardens), until a few miles south of Larache, where there is a nice little open wood, or a park-like belt of cork-trees. These are old-looking trees about 30 ft. average height, few I should say over 35 ft., and are being barked for cork. I believe the extent of this woodment is about 200 acres.

Continuing northwards through Larache, after crossing the river there by a bridge of boats, the road rises some 400 ft. on to the top of a maritime ridge

of what looks like red and ochraceous coloured sandstone with outcrops of metamorphic rock, and runs along it all through the Khabila de Es Sahel alias in parte "le forêt de Boucharen."

For nearly the whole way along this road there is a fine open view to the eastward, right across to the Sumata hills and beyond them the top of the Jebel Alam-Buhasem-Sogna range; while to the westward it is only a few kilometres to the sea; consequently we must have had a fairly comprehensive view of the whole of the Es Sahel country. There was nothing visible but "monte" (brushwood), and in the way of tree-growth, occasional small groves of big, old olive-trees, probably those recorded in "Yebala y el bajo Lucus," but not a single cork-tree.

Heath and bracken, with small sapling corks, form the chief substance of the vegetation clothing the sandstone, just as in Beni Aros; and on the dark soil derived from the metamorphic rocks, which in places outcrop in about equal proportion with the sandstone; Palmetto scrub, Lentisk, *Cytisus albidus*; *Arbutus* in the dips, and again sapling corks. Even this brushwood peters out not far to the eastward, leaving miles of sterile undulations between it and the mountain ranges of Sumata and Beni-Aros.

All this seems to confirm the conclusion provisionally stated, viz. that there are no forests at all in Western Yebala, and that to search Es Sahel or Bucharen for Woodpeckers, Nuthatches, and such like woodland resident birds would almost certainly be a "wild goose chase."

If any of these species or large birds of prey are to be found breeding in the Western Yebala of to-day, I believe the cork-wood south of Larache to be the most likely place; and then only if, as suggested, it really represents the remnant of a once greater woodland area; otherwise it is probably too small and isolated. But facts should not be difficult to obtain from these parts which have a regular automobile service passing through them: an up-to-date ornithological record from Western Yebala is much needed.

INDEX.

- Abdimia, 13.
 abdimii (Abdimia), 13.
 abyssinica (Chalcopelia), 10.
 abyssinicus (Falco), 15.
 — (Irrisor), 114.
 — (Turtur), 10.
 Accipiter, 15, 88, 108, 109, 200, 267.
 accipitrinus (Deropterus), 128.
 Achoragus, 229, 230.
 Acorynus, 231.
 Acrocephalus, 76.
 acuta (Anas), 12.
 — (Oxytenis), 164.
 acutus (Deropygus), 254.
 adolfi-friderici (Scopelus), 114.
 aegra (Nectarinia), 34.
 — (Oenanthe), 30.
 aëroplanes (Hemiprocne), 206, 269.
 aeruginosus (Circus), 88.
 aethiopica (Hirundo), 28.
 aethiopicus (Eurystomus), 115.
 aethiops (Myrmecocichla), 31.
 afer (Eurystomus), 22, 115.
 — (Nilus), 37.
 affinis (Apus), 27.
 — (Tyto), 16.
 afra (Coracias), 22.
 africana (Carduelis), 67.
 — (Chizaerhis), 20.
 — (Emberiza), 68.
 africanus (Bubo), 16.
 Agapornis, 127.
 Agrobates, 32, 78.
 aguirrei (Galerida), 70.
 Aidemosyne, 46.
 airensis (Cercomela), 30.
 Alaemon, 38.
 Alauda, 39, 70.
 alaudipes (Alaemon), 38.
 alba (Motacilla), 38, 71.
 — (Tyto), 16.
 alberti (Halcyon), 132.
 albertorum (Rhipidura), 207.
 albicilla (Halcyon), 132, 277.
 albidior (Lalage), 208.
 albigularis (Hirundo), 28.
 albilunulata (Oxytenis), 155.
 albolaxatus (Caprimulgus), 207.
 albus (Corvus), 47.
 alcedo, 85, 130, 203, 268, 277.
 Alcyone, 130, 204.
 aldabrensis (Fregata), 307, 308, 313.
 alecto (Monarcha), 208.
 Alectoris, 92.
 alexanderi (Eremomela), 34.
 — (Galerida), 40.
 algeriensis (Lanius), 74.
 algirus (Turdus), 79.
 alpestris (Eremophila), 70.
 aluco (Strix), 86.
 amabilis (Opopsitta), 120.
 Amazona, 122.
 amazonum (Aratinga), 122.
 — (Pyrrhura), 122.
 amboinensis (Macropygia), 198.
 Ammomanes, 41, 42.
 amphira (Asthenidia), 139.
 Anas, 12.
 ancyra (Xenocerus), 241.
 andrewsi (Fregata), 306.
 Androphilus, 111.
 angulata (Oxytenis), 170.
 angustata (Hypocysta), 281.
 anisus (Phaeochrotes), 234.
 annulatus (Dinephrus), 228.
 annulipes (Euparius), 244.
 anomalus (Crateropus), 32.
 — (Turdoides), 32.
 Anthribisomus, 258.
 Anthus, 38, 70, 71.
 Antioxenus, 235.
 aolae (Alcyone), 204.
 — (Micropsitta), 121.
 Apatenia, 236.
 apiaster (Merops), 85.
 apicatus (Proscoporphinus), 257.
 Aplonis, 212, 275, 278.
 Apolectella, 245.
 Apus, 27, 83.
 apus (Apus), 27, 83.
 — (Hirundo), 27.
 aquaticus (Cinclus), 82.
 Aquila, 13, 87.
 auiqla (Fregata), 302, 312.

- Araecerus*, 227, 246–250.
Araecorynus, 245.
arafurus (*Araecerus*), 246.
Aratinga, 121, 122.
aravaca (*Oxytenis*), 160.
arborea (*Lullula*), 70.
arous (*Deropygus*), 254.
Ardea, 13.
Arecopais, 260.
arenicola (*Streptopelia*), 91.
arenicolor (*Ammomanes*), 42.
argentatus (*Larus*), 91.
Argyronympha, 293–297.
aridula (*Cisticola*), 34.
ariel (*Fregata*), 310, 311.
aroa (*Hypocysta*), 280.
aromatica (*Treron*), 105.
aruana (*Hypocysta*), 284.
arubensis (*Aratinga*), 122.
— (*Conurus*), 122.
aruensis (*Geoffroyus*), 124.
arvensis (*Alauda*), 70.
ascalaphus (*Bubo*), 16.
aspis (*Hypocysta*), 280.
Asthenidia, 136–150.
ater (*Parus*), 73.
aterrimus (*Scoptelus*), 25, 113, 114.
Athene, 18, 86.
atlas (*Eremophila*), 70.
— (*Erithacus*), 81.
— (*Parus*), 73.
— (*Sitta*), 72.
atra (*Fulica*), 7, 108.
atrata (*Charmosyna*), 119.
atricapilla (*Sylvia*), 77.
atthis (*Alcedo*), 85, 130, 203, 268, 277.
aucupum (*Steganura*), 46.
aurantiiceps (*Poicephalus*), 122.
aurantiifrons (*Loriculus*), 127.
aurantiiventris (*Chloris*), 67.
australasia (*Halcyon*), 132.
australis (*Fulica*), 108.
Autotropis, 241, 242.
azurea (*Alcyon*), 130.

baccula (*Commista*), 236.
badius (*Accipiter*), 15.
Balonodes, 227.
balius (*Hucus*), 233.
barbadensis (*Amazona*), 122.
barbara (*Alectoris*), 92.
barbarus (*Laniarius*), 37.
barbatus (*Gypaëtus*), 89.
— (*Pycnonotus*), 74.
Basitropis, 243.
bataavorum (*Loriculus*), 127.
Baza, 200.
beccarii (*Gallicolumba*), 198, 266, 276.

belisarius (*Aquila*), 13, 87.
beludschicus (*Merops*), 112.
bengalensis (*Centropus*), 109.
bennigseni (*Antioxenus*), 235.
beprea (*Oxytenis*), 168.
berlepschi (*Colius*), 128.
bernsteini (*Eos*), 116.
bethulia (*Janiodes*), 192.
biarmicus (*Falco*), 15.
bicalcaratus (*Francolinus*), 7.
— (*Tetrao*), 7.
bicornis (*Oxytenis*), 164.
bismarckii (*Baza*), 200.
blythi (*Cyclopsitta*), 120.
— (*Opopsitta*), 120.
bolinus (*Tropiderus*), 233.
bonelli (*Phylloscopus*), 76.
borin (*Sylvia*), 77.
bornea (*Eos*), 116.
bougainvillei (*Halcyon*), 133.
brachydactyla (*Calandrella*), 42, 69.
— (*Certhia*), 71.
brachyura (*Sylvieta*), 34.
brachyurus (*Araecorynus*), 245.
bradytus (*Araecerus*), 247.
branickii (*Leptosittaca*), 128.
brehmi (*Ptilopachus*), 6.
brehmorum (*Apus*), 27, 83.
brevis (*Idiopis*), 237.
browni (*Reinwardtoena*), 199.
bruijni (*Micropsitta*), 109.
brunneiceps (*Estrilda*), 46.
Bubo, 16.
bubo (*Bubo*), 16.
Bubuleus, 90.
Bucco, 23.
buchanani (*Crateropus*), 32.
— (*Lybicus*), 23.
— (*Myrmecocichla*), 31.
— (*Riparia*), 28.
— (*Turdoides*), 32.
buckleyi (*Asthenidia*), 149, 150.
Burhinus, 10.
buruanus (*Ptilinopus*), 105.
Butastur, 14.
Buteo, 87, 88.
buteo (*Buteo*), 88.

Cacatoes, 121.
Cacatua, 121.
Cacoorhinus, 243, 244.
Cacomantis, 203.
cafra (*Nyctemera*), 225.
calandra (*Emberiza*), 68.
— (*Melanocorypha*), 69.
Calandrella, 42, 69.
caledonicus (*Nycticorax*), 199.
Calendula, 42.

- callistus* (Gibber), 238.
Caloenas, 267, 276.
calypso (Hypocysta), 284.
campestris (Anthus), 38, 70.
Campethera, 21.
canaria (Serinus), 67.
canibuccalis (Conurus), 121.
cannabina (Carduelis), 67.
canorus (Cuculus), 86.
cantans (Aidemosyne), 46.
cantillans (Sylvia), 77.
Capella, 10, 91.
capensis (Burhinus), 10.
— (*Oedicnemus*), 10.
— (*Scops*), 17.
Caprimulgus, 25, 26, 84, 100, 207.
caprius (Chrysococcyx), 19.
Carduelis, 67.
carduelis (Carduelis), 67.
carteretia (Macropygia), 198.
castaneus (Androphilus), 111.
catenata (Nyctemera), 226.
celata (Asthenidia), 144.
Centropus, 19, 109.
ceramensis (Accipiter), 109.
Cercomela, 30.
Cercophana, 182.
Certhia, 71.
cervinus (Anthus), 38, 71.
— (*Phloeobius*), 227.
Ceryle, 129.
Cettia, 76.
Ceyx, 130, 131.
chadensis (Alauda), 39.
Chaetura, 26.
Chalcopelia, 10.
Chalcophaps, 198, 266, 276.
chalybeocephalus (Monarcha), 208.
Charadrius, 10, 195, 262.
Charmosyna, 119.
Charmosynops, 118, 119, 201.
Chelictinia, 14.
chelicuti (Halcyon), 24, 133.
cheniana (Alauda), 39.
chimaera (Uratelornis), 116.
Chizaerhis, 20.
Chloris, 67.
chloris (Chloris), 67.
choiseuli (Turdus), 273.
chrysochlorus (Chrysococcyx), 19.
Chrysococcyx, 19.
chrysoconus (Pogoniulus), 22.
chrysomela (Monarcha), 207.
Chrysotis, 122.
cia (Emberiza), 68.
Ciconia, 89.
ciconia (Ciconia), 89.
Cinclus, 82.
cinclus (Cinclus), 82.
cinerascens (Bubo), 16.
— (*Monarcha*), 208, 270, 278.
cinerea (Porzana), 263.
cinereocapilla (Motacilla), 38, 71.
Cinnyricinclus, 47.
Cinnyris, 212, 274, 278.
Circaetus, 13, 88.
Circus, 14, 88.
cirlus (Emberiza), 68.
cirtensis (Buteo), 87.
Cisticola, 34, 78, 212.
cisticola (Cisticola), 78.
cetti (Cettia), 76.
clamans (Spiloptila), 33.
Clamator, 19, 86.
clappertoni (Francolinus), 7.
clavipes (Sesia), 298.
cleopatra (Merops), 112.
climacurus (Scotornis), 26.
clypeata (Spatula), 12.
coccinea (Myzomela), 210.
Coccothraustes, 66.
coelebs (Fringilla), 67, 68.
coeruleus (Parus), 73.
Colius, 22, 128, 129.
collectoris (Ceyx), 130.
Collocalia, 206, 269.
collybita (Phylloscopus), 33, 75.
Coloeus, 65.
colonus (Halcyon), 133.
Columba, 12, 90.
columbiana (Asthenidia), 142.
Commista, 236.
communis (Sylvia), 33, 77.
confatalis (Litocercus), 232.
confertus (Xenocercus), 240.
conis (Orniscus), 240.
conjuncta (Lalage), 272.
connectens (Eurystomus), 115.
conspicillata (Sylvia), 78.
continentalis (Ceryle), 129.
Conurus, 121, 122.
Coracias, 22, 85.
corax (Corvus), 47, 65.
corinna (Cinnyris), 212.
corismus (Araecocorynus), 245.
coronatus (Pterocles), 8.
corone (Corvus), 65.
coronoides (Corvus), 213.
corporaali (Apolectella), 245.
— (*Araecercus*), 249.
corticeus (Anthribisomus), 259.
corvina (Corvinella), 37.
Corvinella, 37.
Corvus, 47, 48, 65, 213.
Corynecia, 230.
Cossypha, 31.

- Coturnix, 6, 92.
 coturnix (Coturnix), 6, 92.
 — (Tetrao), 6.
 Cotyle, 29.
 Crateropus, 32.
 crecca (Anas), 12.
 Crex, 92.
 crex (Crex), 92.
 Crinifer, 20.
 cristata (Galerida), 69.
 oruentata (Myzomela), 210.
 cruralis (Acorynus), 231.
 cryptostictus (Scoptelus), 25, 114.
 cucullatus (Harpolestes), 74.
 — (Phyllergates), 110.
 — (Ploceus), 45.
 Cuculus, 86.
 cursor (Charadrius), 10.
 — (Cursorius), 10.
 Cursorius, 10.
 curvirostra (Loxia), 67.
 cyaneiceps (Prioniturus), 125.
 cyanicarpus (Geoffroyus), 124.
 Cyanorhamphus, 127.
 cyanostictus (Melittophagus), 112.
 Cyclopsittacus, 120.
 cyrtus (Araecerus), 249.
 dacrytus (Xenocerus), 240.
 dammeriana (Halcyon), 132.
 dampieri (Accipiter), 200, 267.
 danae (Tanysiptera), 133.
 dauma (Turdus), 273.
 decolor (Platyphima), 290.
 deichleri (Turdus), 78.
 delicatula (Chalcopelia), 10.
 delicatulus (Turtur), 10.
 Delichon, 82.
 Demigretta, 267, 277.
 Deroptyus, 128.
 Deropygus, 251–255.
 deserti (Ammomanes), 41.
 — (Oenanthe, Saxicola), 30.
 desertorum (Bubo), 16.
 desmarestii (Phalacrocorax), 90.
 devittata (Domicella), 201.
 devittatus (Lorius), 117.
 Dicaeum, 211.
 Dicrocercus, 113.
 didymus (Caccorhinus), 244.
 — (Deropygus), 251.
 diffissa (Asthenidia), 145, 146.
 Dinema, 256.
 Dinephrus, 227, 228.
 diophthalmus (Opopsitta), 120.
 Diplootocus, 80.
 discolor (Leptosomus), 116.
 discurus (Prioniturus), 125.
 dispar (Ceyx), 131.
 dispar (Platyphima), 289.
 disturbans (Androphilus), 111.
 divisa (Homoeopteryx), 179.
 djampeae (Tanygnathus), 126.
 djampeana (Cacatoes), 121.
 — (Cacatua), 121.
 djampeanus (Trichoglossus), 118.
 dognini (Janiodes), 188.
 dohertyi (Loriculus), 127.
 dolosa (Basitropis), 243.
 domesticus (Passer), 68.
 Domicella, 117, 201.
 dominicus (Charadrius), 195, 262.
 downingi (Autotropis), 242.
 Dryobates, 85.
 Ducula, 196, 265.
 dubius (Bucco), 23.
 — (Lybius), 23.
 dufouri (Plintheria), 234.
 dumasi (Geocichla), 110.
 — (Phyllergates), 110.
 dumontii (Mino), 212.
 dunni (Calendula), 42.
 duperreyii (Megapodius), 195, 276.
 Eclectus, 123.
 ecuadorensis (Janiodes), 189.
 Edolisoma, 209, 272, 278.
 eichhorni (Collocalia), 269.
 — (Erythrura), 274, 278.
 — (Gallicolumba), 266, 276.
 — (Monarcha), 271.
 — (Turdus), 273.
 Elanoides, 14.
 Electron, 129.
 elegans (Deropygus), 252.
 — (Homoeopteryx), 178.
 — (Pitta), 110.
 Emberiza, 43, 44, 68, 69.
 emini (Agapornis), 127.
 enigma (Halcyon), 133.
 Eos, 116, 117.
 epiphaea (Oxytenis), 166.
 epipona (Basitropis), 243.
 epops (Upupa), 24, 85.
 eremita (Megapodius), 195, 276.
 eremogiton (Halcyon), 24, 133.
 Eremomela, 34.
 Eremophila, 70.
 Eremopterix, 43.
 Erithacus, 81.
 erlangeri (Galerida), 69.
 erosa (Oxytenis), 163.
 Erycinidia, 285, 286.
 erythrauchen (Accipiter), 109.
 erythropterus (Melittophagus), 122.
 erythropygia (Mirafra), 39.

- erythrorhynchos (Irisor), 24, 114.
 erythrorhynchos (Phoeniculus), 114.
 Erythrospiza, 45.
 Erythrura, 111, 274, 278.
 Esacus, 262.
 esculenta (Collocalia), 206.
 Estrilda, 46.
 Euciodes, 260.
 Eulabeornis, 262.
 eumelas (Sesia), 298.
 Euparius, 244.
 euptychioides (Platyphthima), 289.
 europaea (Sitta), 72, 73.
 europaeus (Caprimulgus), 25, 84.
 Eurystomus, 22, 115, 205, 268.
 eutreptorhyncha (Pelargopsis), 129.
 overetti (Rhytidoceros), 114.
 excelsus (Parus), 73.
 excubitor (Lanius), 36, 74.
 exilis (Cisticola), 212.
 Exillis, 260.
 eximium (Dicaeum), 211.
 eximius (Caprimulgus), 26.
 explorator (Geoffroyus), 125.

 falcinellus (Plegadis), 13.
 Falco, 13, 15, 86, 87, 109.
 fastigata (Apatenia), 236.
 ferox (Buteo), 87.
 ferreti (Tchitrea), 35.
 ferruginea (Oxytenis), 171.
 finschi (Pachycephala), 209.
 finschii (Micropsitta), 202.
 flava (Motacilla), 38, 71.
 flavicans (Trichoglossus), 201, 267, 277.
 flavifrons (Poicephalus), 122.
 flavigaster (Emberiza), 43.
 flavigastra (Cinnyris), 212, 274, 278.
 flaviventris (Emberiza), 43.
 — (Eremomela), 34.
 flavotectus (Trichoglossus), 118.
 floris (Tanygnathus), 126.
 forbesi (Cyanoramphus), 127.
 forsteni (Trichoglossus), 118.
 fortis (Asthenidia), 146.
 — (Trichoglossus), 118.
 francica (Collocalia), 269.
 Francolinus, 7.
 frater (Lybius), 23.
 fraterna (Autotropis), 242.
 frauenfeldi (Cercophana), 182.
 Fregata, 302–313.
 frenatus (Gibber), 238.
 Fringilla, 67, 68.
 Fringillaria, 44.
 frontalis (Eremopterix), 43.
 — (Sporopipes), 45.
 fuciphaga (Collocalia), 206, 269.

 Fulica, 7, 108.
 fulvus (Charadrius), 195, 262.
 — (Crateropus, Turdoides), 32.
 — (Gyps), 89.
 funebris (Melanopsacus), 255.
 fuscicapilla (Zosterops), 211.
 fuscifrons (Deropterus), 128.
 fuscus (Larus), 92.
 — (Ptilopachus), 6.

 gabar (Melierax), 14.
 — (Micronisus), 14.
 galactotes (Agrobates), 32, 78.
 galeata (Numida), 6.
 Galerida, 40, 69, 70.
 galilejensis (Apus), 27.
 Gallicolumba, 198, 266, 276.
 gallicus (Circetus), 13, 88.
 gallinago (Capella, Scolapax), 10, 91.
 Garrulus, 65.
 garrulus (Coracias), 85.
 geloensis (Lophoceros), 115.
 Geocichla, 110.
 geoffroyi (Geoffroyus), 123, 124.
 Geoffroyus, 123–125, 201.
 geometraria (Asthenidia), 143.
 geyri (Ammomanes), 41.
 Gibber, 238.
 gibraltariensis (Phoenicurus), 80.
 gigantea (Oxytenis), 172.
 gigas (Eurystomus), 115.
 — (Phloeobius), 227.
 girrenera (Haliastur), 200, 277.
 githaginea (Erythrospiza), 45.
 giton (Deropygus), 255.
 glandarius (Clamator), 19, 86.
 — (Garrulus), 65.
 Glaucidium, 19.
 glaucurus (Eurystomus), 115.
 Globicera, 196.
 godmani (Opopsitta), 120.
 goertae (Mesopicos), 21.
 goliathina (Charmosyna), 119.
 — (Platyphthima), 290.
 goodsoni (Lorius), 123, 203.
 — (Macropygia), 266, 276.
 gordonii (Hirundo), 28.
 goslingi (Emberiza), 44.
 — (Fringillaria), 44.
 gracilipes (Argyronympha), 295.
 gracilis (Deropygus), 252.
 — (Erycinidia), 286.
 graculus (Phalacrocorax), 90.
 — (Pyrrhocorax), 66.
 granti (Lophoceros), 114.
 Graucalus, 209.
 greenwoodii (Araecerus), 246.
 grisea (Commista), 236.

- griseogularis (Urocolius), 129.
 guineensis (Irrisor), 24.
 guizona (Argyronympha), 296.
 Gulamentus, 237.
 gularis (Eurystomus), 115.
 guttulata (Ceryle), 129.
 Gymnoris, 45.
 Gypaëtus, 89.
 Gyps, 89.

 haematodus (Trichoglossus), 118, 201, 267, 277.
 haemonia (Hypocysta), 280.
 Halcyon, 24, 132, 133, 205, 268, 277.
 haliaetus (Pandion), 88.
 Haliastur, 200, 277.
 Harpolestes, 37, 74.
 Harsiësis, 291–293.
 harterti (Lullula), 70.
 hathor (Hypocysta), 284.
 haussarum (Prionops), 37.
 hebetior (Monarcha), 270, 271.
 hecaerge (Hariësis), 293.
 Hedydipna, 34.
 heinrothi (Turdus), 273.
 Hemiprocne, 206, 269, 277.
 hercules (Deropygus), 254.
 hermonensis (Calandrella), 42.
 hesperia (Nyctemera), 222.
 heteroclitus (Geoffroyus), 201.
 heuglini (Dicrocercus), 113.
 Hieraëtus, 87.
 hiogaster (Accipiter), 108, 200, 267.
 Hippolais, 33, 76.
 hirundineus (Dicrocercus), 113.
 Hirundo, 27, 28, 82.
 hispanica (Oenanthe), 30, 80.
 hispaniensis (Sitta), 72, 73.
 hispaniolensis (Passer), 68.
 hoggara (Streptopelia), 11.
 homochroa (Platyphthima), 288, 289.
 Homoeodera, 229.
 Homoeopteryx, 175.
 Hormiscops, 227.
 hortensis (Sylvia), 33, 77.
 hortulana (Emberiza), 69.
 Hucus, 233.
 huonis (Platyphthima), 289.
 Hyalodia, 285.
 hydrocharis (Tanysiptera), 133.
 hygea (Hariësis), 291–293.
 Hypocharmosyna, 118.
 Hypocysta, 279–285.
 hypoenochrous (Lorius), 117.
 hypoinochroa (Domicella), 117, 201.
 hypoleuca (Motacilla), 36.
 — (Muscicapa), 36, 75.
 hypoleucos (Tringa), 195, 262, 276.
 Hypotaenidia, 195.

 hypoxantha (Aratinga, Pyrrhura), 122.
 hypoxantha (Pyrrhura), 122.
 — (Zosterops), 211.

 ibis (Bubulcus), 90.
 Idiopus, 237.
 ignicapillus (Regulus), 74.
 inca (Asthenidia), 146.
 indus (Haliastur), 200, 277.
 inferior (Ptilinopus), 265.
 ingrami (Fulica), 108.
 inornata (Sylvia), 77.
 inornatus (Caprimulgus), 25, 26.
 inseparabilis (Cyclopsittacus), 120.
 — (Opopsitta), 120.
 insignis (Ceryle), 129.
 insolitus (Ptilinopus), 197, 265.
 insularis (Corvus), 213.
 — (Eos), 117.
 intensa (Tanysiptera), 133.
 intermedia (Palaeornis), 126.
 — (Psittacula), 126.
 intermedius (Leptosomus), 116.
 — (Monachalcyon), 133.
 — (Trichoglossus), 118.
 interposita (Halcyon), 132.
 iredalei (Fregata), 312.
 iris (Neopsittacus), 120.
 Irrisor, 24, 114.
 isis (Hypocysta), 284.
 ispida (Alcedo), 130.

 jacobinus (Clamator), 19.
 janiodes, 186–193.
 jobina (Hariësis), 292.
 johannae (Gallicolumba), 198.
 johannis (Ptilinopus), 197, 265, 276.
 johnstoniae (Trichoglossus), 118.
 jonesi (Nyctemera), 223.
 jugularis (Cinnyris), 212, 274, 278.
 juncidis (Cisticola), 34, 78.

 kabylorum (Troglodytes), 82.
 karu (Lalage), 208.
 keiensis (Micropsitta), 121.
 kikuyensis (Colius), 128.
 kleinschmidti (Galerida), 69.
 klossi (Platyphthima), 290.
 koenigi (Fringilla), 67.
 — (Mesopicos), 21.
 krakari (Hypocharmosyna), 118.
 krameri (Palaeornis), 21.
 — (Psittacula), 21.
 kreffti (Mino), 212.
 kühni (Eos), 116.

 labidus (Acorynus), 231.
 lactucina (Asthenidia), 148.
 laeta (Argyronympha), 294.

- Lalage*, 208, 272.
Laniarius, 37.
Lanius, 36, 37, 74.
Larus, 91, 92.
lateralis (*Caccorhinus*), 243.
laverna (*Janiodes*), 187.
leda (*Oxytenis*), 161.
lepida (*Ceyx*), 130.
— (*Hypocysta*), 283.
Leptosittaca, 128.
Leptosomus, 116.
lesouefi (*Hypotaenidia*), 195.
leucocephalus (*Colius*), 129.
leucogaster (*Cinnyricinclus*), 47.
— (*Turdus*), 47.
leucomelas (*Platypthima*), 288.
leucopyga (*Oenanthe*), 30.
leucopygos (*Lanius*), 36.
leucorhous (*Sparvius*), 14.
leucotis (*Colius*), 128.
— (*Eremopterix*), 43.
— (*Otus*), 18.
leucura (*Tanyisiptera*), 134.
leucurus (*Oenanthe*), 80.
levipennis (*Araecerus*), 248.
lichtensteinii (*Pterocles*), 8.
limbata (*Autotropis*), 242.
Lissotis, 9.
Litocerus, 232.
livia (*Columba*), 12, 90.
Locustella, 76.
longipennis (*Macrodipteryx*), 26.
Lophoceros, 114, 115.
Loriculus, 127, 201.
Lorius, 117, 123, 203.
lory (*Domicella*, *Lorius*), 117.
Loxia, 67.
lugubris (*Ceryle*), 129.
Lullula, 70.
Luscinia, 81.
lutens (*Passer*)^{*}, 44.
luteolus (*Ploceus*), 46.
Lybius, 23.

macilwraithi (*Cyclopsittacus*), 120.
macklotii (*Pitta*), 207.
maclennani (*Geoffroyus*), 124.
macrodipteryx, 26.
Macropygia, 198, 199, 266, 276.
macrourus (*Circus*) 14.
— (*Colius*), 22.
macrurus (*Caprimulgus*), 109, 207.
— (*Urocolius*), 129.
maculatus (*Anthribisomus*), 258.
maculosus (*Burhinus*, *Oedionemus*), 10.
mada (*Prioniturus*), 109, 125.
Madanga, 111.
magnificens (*Fregata*), 303, 305, 313.

magnirostris (*Esacus*), 262.
major (*Domicella*), 117.
— (*Dryobates*), 85.
— (*Homoeopteryx*), 177.
— (*Lorius*), 117.
— (*Parus*), 73.
— (*Scoptelus*), 113.
malecena (*Homoeopteryx*), 176.
mandibularis (*Nycticorax*), 199.
manifesta (*Nyctemera*), 224.
margaritatus (*Trachyphonus*), 22.
mathewsi (*Fregata*), 309.
matthiae (*Halcyon*), 268, 277.
— (*Phylloscopus*), 272.
— (*Rhipidura*), 271.
maudei (*Erycinidia*), 286.
mauretanica (*Strix*), 86.
mauretanus (*Dryobates*), 85.
mauritus (*Dinephrius*), 228.
mediterranea (*Carduelis*), 67.
medius (*Centropus*), 109.
meeki (*Ceyx*), 131.
— (*Cyclopsitta*), 120.
— (*Hypocharmosyna*), 118.
— (*Loriculus*), 127.
— (*Micropsitta*), 121, 267, 277.
— (*Porzana*), 263.
— (*Syma*), 131.
Megacorma, 298.
megalorhynchos (*Tanygnathus*), 126.
Megapodius, 195, 276.
megarhyncha (*Luscinia*), 81.
meiffreni (*Ortyxelos*), 9.
melanarius (*Turdus*), 273.
melanocephala (*Eremopterix*), 43.
— (*Sylvia*), 77.
Melanocorypha, 69.
melanoleuca (*Oenanthe*), 30.
melanoleucos (*Lophoceros*), 115.
Melanopsacus, 255.
melanorhyncha (*Pelargopsis*), 129.
melanotus (*Porphyrio*), 105.
melanura (*Cercomela*), 30.
melba (*Apus*), 83.
Melierax, 14, 15.
Melittophagus, 112, 113.
mencke (*Monarcha*), 269.
meridionalis (*Caprimulgus*), 26.
Merops, 22, 85, 112, 205, 268, 277.
merula (*Turdus*), 79.
mesophanis (*Caprimulgus*), 109.
Mesopicos, 21.
mesotypus (*Poicephalus*), 20.
metallica (*Aplonis*), 212, 275, 278.
meyeri (*Poicephalus*), 122.
michahellesii (*Larus*), 91.
Microdulia, 185.
Micronisus, 14.

Micropsitta, 109, 121, 202, 267, 277.
micrura (*Sylvietta*), 34.
micula (*Ormiscus*), 239.
migrans (*Milvus*), 88.
Milvus, 88.
milvus (*Milvus*), 88.
Mino, 212.
minor (*Agrobates*), 32.
— (*Electron*), 129.
— (*Fregata*), 306, 307, 308, 313.
— (*Prionirhynchus*), 129.
mirabilis (*Microdulia*), 185.
— (*Oxytenis*), 157.
Mirafra, 39.
modesta (*Autotropis*), 241, 242.
modestia (*Oxytenis*), 153.
mombasicus (*Colius*), 128.
Monachalcyon, 133.
monachus (*Monachalcyon*), 133.
— (*Necrosyrtes*), 13.
Monarcha, 207, 208, 269, 270, 271, 278.
monedula (*Coloeus*), 65.
Monticola, 31, 33, 36, 79.
mordellinus (*Araecerus*), 250.
morio (*Edolisoma*), 209, 272, 278.
Motacilla, 31, 38, 71.
moussieri (*Diplootocus*), 80.
mulcata (*Ceyx*), 131.
mülleri (*Melittophagus*), 113.
multistriata (*Charmosynopsis*), 119.
Munia, 213.
muraria (*Tichodroma*), 72.
murinus (*Apus*), 27, 83.
— (*Cacoorhinus*), 244.
Muscicapa, 36, 75.
musicus (*Melierax*), 15.
— (*Turdus*), 79.
mussaui (*Rhipidura*), 271.
mya (*Ammomanes*), 41.
Myioceyx, 131.
Myrmecocichla, 31.
mystacea (*Hemiprocne*), 206, 269, 277.
Myzomela, 210, 211, 274.

naemia (*Oxytenis*), 158, 160.
naevia (*Coracias*), 22.
Nasiterna, 121.
naumanni (*Falco*), 86.
Necrosyrtes, 13.
Nectarinia, 34.
neglectus (*Eurystomus*), 115.
Neocercophana, 184.
neohanoveranus (*Eurystomus*), 115, 205, 268.
Neophron, 89.
Neopsittacus, 120.
nerina (*Nyctemera*), 220.
neumanni (*Melierax*), 15.
nicobarica (*Caloenas*), 267, 276.

nicolli (*Fregata*), 309.
niger (*Melierax*), 14.
— (*Micronisus*), 14.
— (*Sparvius*), 14.
nigerrima (*Munia*), 213.
nigriceps (*Tanysepta*), 134.
nigrifrons (*Opopsitta*), 120.
nigrirostris (*Macropygia*), 199.
nigrita (*Hariësis*), 292.
— (*Myzomela*), 211, 274.
nigromaxilla (*Ceyx*), 130.
nigropuncta (*Janiodes*), 188.
Nilaus, 37.
Ninox, 200.
nisus (*Accipiter*), 88.
nitida (*Aplonis*), 212, 275, 278.
nitidus (*Araecerus*), 250.
noctua (*Athene*), 18, 86.
noctula (*Hariësis*), 292.
notandus (*Araecerus*), 248.
novae-hibernicae (*Pitta*), 207.
nuba (*Lissotis*, *Otis*), 9.
nubila (*Oxytenis*), 163, 164.
Numenius, 195.
Numida, 6.
nusae (*Halcyon*), 205.
nyansae (*Poicephalus*), 122.
Nyctemera, 217–226.
Nycticorax, 13, 199.
— (*Ardea*), 13.
— (*Nycticorax*), 13.
Nyroca, 12.
nyroca (*Nyroca*), 12.

obiensis (*Eos*), 117.
obliqua (*Megacorma*), 298.
obsoleta (*Riparia*), 28, 29.
occidentalis (*Cacatoes*), 121.
ochracea (*Syma*), 131.
ochropus (*Tringa*), 10, 91.
ochruros (*Phoenicurus*), 80.
Oedienemus, 10.
Oenanthe, 29, 30, 79, 80.
oenanthe (*Oenanthe*), 29, 79.
oenas (*Columba*), 90.
omoensis (*Dicrocercus*), 113.
omphalus (*Araecerus*), 246.
opaca (*Hippolais*), 33, 77.
Opopsitta, 120.
orecta (*Oxytenis*), 160.
orientalis (*Eurystomus*), 115, 205, 268.
— (*Merops*), 22, 112.
Oriolus, 47, 66.
oriolus (*Oriolus*), 47, 66.
Ormiscus, 239, 240.
ornata (*Platyptilima*), 287.
ornatus (*Merops*), 205, 268, 277.
Ortyxelos, 9.

- osyris (*Hypocysta*), 281–283, 284.
 Otis, 9.
 Otroeda, 220, 221–225.
 Otus, 17, 18, 86.
 owstoni (*Halcyon*), 132.
 Oxytenis, 151–176.

Pachycephala, 209, 274.
Palaeornis, 21, 126.
pallida (*Gymnoris*), 45.
 — (*Hippolais*), 33, 77.
pallidiceps (*Accipiter*), 108.
 — (*Scoptelus*), 114.
pallidior (*Calendula*), 42.
 — (*Charmosynopsis*), 118, 201.
 — (*Sporopipes*), 45.
pallidus (*Apus*), 27.
 — (*Poicephalus*), 122.
palumbus (*Columba*), 90.
Pandion, 88.
pandora (*Platyptilima*), 290.
papilionaris (*Nyctemera*), 224.
papuanus (*Falco*), 109.
papuensis (*Basitropis*), 243.
 — (*Graucalus*), 209.
paradisea (*Steganura*), 46.
paraensis (*Asthenidia*), 150.
Parus, 73.
parvula (*Cacatua*), 121.
Passer, 44, 68.
paulina (*Asthenidia*), 144.
pectoralis (*Eclectus*), 123.
 — (*Pachycephala*), 209, 274.
pedaloidina (*Platyptilima*), 291.
pelagia (*Hypocysta*), 283.
pelagica (*Alcedo*), 130, 203, 268, 277.
Pelargopsis, 129.
pelegrinoides (*Falco*), 15.
pellucida (*Hypocysta*), 281.
percnopterus (*Neophron*), 89.
peregrina (*Oxytenis*), 165.
peregrinus (*Falco*), 15.
perlatus (*Glaucidium*), 19.
permagnifica (*Nyctemera*), 225.
perpallidus (*Monarcha*), 270, 278.
perplexa (*Halcyon*), 132.
personatus (*Geoffroyus*), 125.
pertinax (*Aratinga*), 122.
Petronia, 68.
petronia (*Petronia*), 68.
petrosus (*Anthus*), 71.
 — (*Ptilopachus*), 6.
Phaeochrotes, 234.
phaeopus (*Numenius*), 195.
Phalacrocorax, 90.
philippensis (*Hypotaenidia*), 195.
 — (*Loriculus*), 127.
philippii (*Neocercophana*), 184.

Philomachus, 10.
philomelos (*Turdus*), 79.
Phloeobius, 227.
Phoeniculus, 114.
Phoenicurus, 29, 80.
phoenicurus (*Ammomanes*), 42.
 — (*Phoenicurus*), 29, 80.
Phyllergates, 110.
Phylloscopus, 33, 75, 76, 272.
Pica, 65.
pica (*Clamator*), 19.
picta (*Aratinga*), 122.
 — (*Psittacula*), 126.
 — (*Pyrrhura*), 122.
Picus, 21, 85.
Picridopsis, 286.
pilaris (*Turdus*), 79.
pinaiae (*Erythrura*), 111.
piscator (*Crinifer*), 20.
Pitta, 110, 207.
placensis (*Charmosynopsis*), 118, 201.
placiva (*Platyptilima*), 287.
plagiatus (*Litocercus*), 232.
planax (*Nyctemera*), 221.
platenae (*Prioniturus*), 125.
platura (*Hedydipna*), 34.
platurus (*Prioniturus*), 125.
Platyptilima, 286–291.
platyrhynchus (*Electron*), 129.
 — (*Prionirhynchus*), 129.
plebejus (*Crateropus*, *Turdoides*), 32.
Plegadis, 13.
plettina (*Oxytenis*), 167.
plicatus (*Rhyticeros*), 206.
Plintheria, 234, 335.
Ploceus, 45, 46.
plumatus (*Prionops*), 37.
plusiota (*Hypocysta*), 280.
podaliraria (*Asthenidia*), 139.
Pogoniulus, 22.
Poicephalus, 20, 122, 123.
Poliornis, 14.
polyglotta (*Hippolais*), 76.
Porphyrio, 105.
Porzana, 263, 264.
pratensis (*Anthus*), 71.
Prionirhynchus, 129.
Prioniturus, 109, 125.
Prionops, 37.
proles (*Hucus*), 233.
prona (*Homoeopteryx*), 177.
Proscoporphinus, 257.
Proscopus, 256.
proxima (*Micropsitta*), 267, 277.
Prunella, 82.
Pseudopsittacus, 124.
Psittacula, 21, 126.
Pterocles, 7, 8.

Ptilinopus, 105, 197, 198, 265, 276.
Ptilopachus, 6.
pugnax (*Philomachus*), 10.
pulchella (*Nectarinia*), 34.
pulcher (*Spreo*), 46.
pulchra (*Argyronympha*), 294.
pullaria (*Agapornis*), 127.
pullicauda (*Neopsittacus*), 120.
pumilio (*Achoragus*), 229.
pumilus (*Araecerus*), 247.
punctatus (*Picus*), 21.
punctifrons (*Remiz*), 35.
punctuligera (*Campethera*), 21.
punctuligerus (*Picus*), 21.
purpurea (*Ardea*), 13.
pusilla (*Alcyon*), 204.
pusillus (*Melittophagus*), 112.
pusio (*Micropsitta*), 121.
Pycnonotus, 74.
pygargus (*Circus*), 88.
pygmaea (*Nasiterna*), 121.
pyrgita (*Gymnoris*), 45.
Pyrrhocorax, 66.
Pyrrhura, 122.

quadricinctus (*Pterocles*), 8.

ramsayi (*Myzomela*), 211, 274.
rapax (*Aquila*), 13, 87.
Regulus, 74.
Reinwardtoena, 199.
reiscri (*Hippolais*), 33.
Remiz, 35.
remota (*Megacorma*), 298.
remotum (*Edolisoma*), 209.
rendova (*Argyronympha*), 296.
Rhipidura, 207, 271.
rhpidurus (*Corvus*), 48.
rhodinolaema (*Ducula*), 196, 265.
Rhyticeros, 206.
Rhytidoceros, 114.
richardsi (*Alcyon*), 204.
ridgwayi (*Fregata*), 308, 313.
riocourii (*Chelictinia*, *Elanoides*), 14.
Riparia, 28, 29, 83.
riparia (*Riparia*), 83.
rivolii (*Ptilinopus*), 105, 198.
roratus (*Lorius*), 123, 203.
roseogrisea (*Streptopelia*), 11.
rosseliana (*Domicella*), 117.
rosselianus (*Lorius*), 117.
rothschildi (*Amazona*), 122.
— (*Eos*), 116.
— (*Fregata*), 303, 305, 313.
rotundatus (*Araecerus*), 249.
rubecula (*Erithacus*), 81.
rubetra (*Saxicola*), 31, 80.
rubianensis (*Argyronympha*), 295.

rubicola (*Saxicola*), 80.
rubricera (*Ducula*), 196.
— (*Globicera*), 196.
rubrigularis (*Hypocharmosyna*), 118.
rudis (*Ceryle*), 129.
rufa (*Macropygia*), 266.
ruficollis (*Corvus*), 47.
— (*Madanga*), 111.
— (*Rhyticeros*), 206.
ruficolor (*Galerida*), 70.
rufipennis (*Butastur*, *Poliornis*), 14.
rufiventris (*Poicephalus*), 122.
— (*Rhipidura*), 207, 271.
rugulosa (*Autotropis*), 242.
rupestris (*Cotyle*), 29.
— (*Riparia*), 83.
russea (*Janiodes*), 191.
rustica (*Hirundo*), 28, 82.

sacra (*Demigretta*), 267, 277.
saharac (*Passer*), 44.
sahari (*Emberiza*), 44.
salax (*Asthenidia*), 141.
salomonensis (*Alcedo*), 130.
salvadorii (*Micropsitta*, *Nasiterna*), 121.
sancta (*Halcyon*), 268.
Sarciophorus, 10.
satisfona (*Platyptilima*), 289.
saturatus (*Poicephalus*), 122.
saurophaga (*Halcyon*), 277.
saxatilis (*Monticola*), 31, 79.
— (*Turdus*), 31.
Saxicola, 30, 31, 80.
scalaris (*Xenocerus*), 240.
schubotzi (*Pogoniulus*), 22.
sclateri (*Graucalus*), 209.
Scolopax, 10.
Scops, 17.
scops (*Otus*), 18, 86.
Scoptelus, 25, 113, 114.
Scotornis, 26.
scotti (*Corynecia*), 230.
senator (*Lanius*), 37, 74.
senegala (*Estrilda*), 46.
senegalensis (*Centropus*), 19.
— (*Otis*), 9, 17.
— (*Pterocles*), 8.
— (*Scops*), 17.
— (*Streptopelia*), 11.
— (*Zosterops*), 35.
senegallus (*Pterocles*), 7.
— (*Tetrao*), 7.
senegalus (*Harpolestes*), 37, 74.
— (*Poicephalus*), 20.
septemstriata (*Emberiza*), 44.
sepulchralis (*Cacomantis*), 203.
serapis (*Hypocysta*), 282.
sericeus (*Cinnyris*), 212.

- Serinus, 67.
 serinus (Serinus), 67.
 Sesia, 298.
 severus (Falco), 109.
 sexuvarya (Pachycephala), 274.
 sharpei (Melittophagus), 112.
 sibilatrix (Phylloscopus), 76.
 silex (Araecerus), 246.
 simplex (Deropygus), 251.
 — (Passer), 44.
 — (Platypthima), 287.
 simplicior (Caprimulgus), 26.
 Sitta, 72, 73.
 snelli (Homoeodera), 229.
 sobrina (Oxytenis), 158.
 solitaria (Ceyx), 131.
 solitarius (Monticola), 79.
 solitudinis (Athene), 18.
 solomonensis (Eclectus), 123.
 — (Lorius), 123, 203.
 — (Ptilinopus), 197, 265, 276.
 sordida (Halcyon), 133.
 sordidus (Halcyon), 133.
 spadix (Oxytenis), 173.
 Sparvius, 14.
 Spatula, 12.
 spatzi (Cotyle, Riparia), 29.
 speculigera (Muscicapa), 75.
 sphenurus (Accipiter), 15.
 Spiloptila, 33.
 pilosus (Deropygus), 253.
 spinicauda (Asthenidia), 147.
 spinoletta (Anthus), 71.
 spinus (Carduelis), 67.
 Sporopipes, 45.
 Spreo, 46.
 Steganura, 46.
 stellae (Charmosyna), 119.
 stephani (Chalcophaps), 198, 266, 276.
 Sterna, 108.
 stichus (Litocercus), 232.
 Streptopelia, 11, 91.
 striata (Muscicapa), 36, 75.
 striatus (Colius), 128.
 stricturaria (Asthenidia), 146.
 striolata (Emberiza), 44.
 Strix, 18, 86.
 strumosa (Fregata), 308, 313.
 Sturnus, 66.
 suavis (Araecerus), 249.
 suberistata (Baza), 200.
 subtilis (Plintheria), 235.
 suecica (Luscinia), 81.
 sulphurea (Cacatoes), 121.
 suluensis (Prioniturus), 125.
 sumatrana (Sterna), 108.
 sumbavensis (Geoffroyus), 124.
 superbus (Ptilinopus), 198.
 suturalis (Araecerus), 227.
 swinderianus (Agapornis), 127.
 Sylvia, 32, 33, 77, 78.
 Sylvieta, 34.
 Syma, 131.
 syntactus (Colius), 22.
 syssauroides (Homoeopteryx), 178.
 taeniatus (Gulamentus), 237.
 talautensis (Prioniturus), 125.
 Talpella, 228.
 tantillus (Achoragus), 230.
 Tanygnathus, 126.
 Tanyptera, 133, 134.
 targia (Columba), 12.
 targius (Pterocles), 8.
 Tchitrea, 35.
 tectus (Sarciophorus), 10.
 tenebrica (Hariësis), 291.
 tener (Loriculus), 201.
 tentelare (Syma), 131.
 tenuimargo (Nyctemera), 224.
 tenuisquamosa (Hyalodia), 285.
 terminalis (Asthenidia), 142.
 tessellatus (Anthribisomus), 258.
 Tetrao, 6, 7.
 theklæ (Galerida), 69, 70.
 thomasseti (Hormiscops), 227.
 Tichodroma, 72.
 timorlaensis (Geoffoyus), 123.
 tingitanus (Passer), 68.
 tinnunculus (Falco), 15, 86.
 tomentosus (Balanodes), 227.
 toni (Sylvia), 78.
 torotoro (Syma), 131.
 torquata (Saxicola), 80.
 torquatus (Turdus), 79.
 Trachyphonus, 22.
 transversaria (Asthenidia), 140, 141.
 Treron, 105.
 Trichoglossus, 118, 201, 267, 277.
 trichroa (Erythrura), 111, 274, 278.
 tricolor (Eulabeornis), 262.
 tridens (Asthenidia), 146.
 Tringa, 10, 91, 195, 262, 276.
 tringorum (Halcyon), 132.
 tristrami (Halcyon), 132, 205.
 — (Micropsitta, Nasiterna), 121.
 trivialis (Anthus), 38, 71.
 trivirgatus (Phylloscopus), 272.
 trochilus (Phylloscopus), 33, 76.
 Troglodytes, 82.
 troglodytes (Troglodytes), 82.
 Tropiderus, 233.
 truncatus (Deropygus), 251.
 Turdoides, 32.
 Turdus, 31, 47, 78, 273.
 turneri (Colius), 129.

- Turtur, 10.
 turtur (*Streptopelia*), 11, 91.
 Tyto, 16.

 ugandae (*Agapornis*), 127.
 — (*Myioceyx*), 131.
 ugandensis (*Colius*), 128.
 ugiensis (*Argyronympha*), 297.
 ulava (*Argyronympha*), 296.
 ultramarinus (*Parus*), 73.
 undata (*Sylvia*), 78.
 unicolor (*Sturnus*), 66.
 Upupa, 24, 85.
 Uratelornis, 116.
 urbica (*Delichon*), 82.
 Urocolius, 129.
 ussheri (*Chaetura*), 26.

 vagulus (*Litocerus*), 232.
 vaillanti (*Picus*), 85.
 vanicorensis (*Collocalia*), 206, 269.
 variegata (*Eos*), 117.
 — (*Ninox*), 200.
 variegatus (*Numenius*), 195.
 veitchi (*Proscopus*), 256.
 vella (*Argyronympha*), 296.
 venusta (*Cercophana*), 183.
 verreauxi (*Steganura*), 46.
 versteri (*Poicephalus*), 20.
 verticalis (*Cossypha*), 31.
 — (*Monarcha*), 207.
 vesperina (*Nyctemera*), 222-224.
 vieilloti (*Lybius*), 23.
 virago (*Cyclopsittacus*), 120.

 — (*Opopsitta*), 120.
 virgata (*Janiodes*), 191.
 virgo (*Pieridopsis*), 286.
 viridifrons (*Micropsitta*), 121, 202.
 — (*Nasiterna*), 121.
 viridipectus (*Micropsitta*), 121.
 — (*Nasiterna*), 121.
 viridis (*Merops*), 112.
 — (*Tchitrea*), 35.
 viridissimus (*Merops*), 22.
 viscivorus (*Turdus*), 78.
 vitellinus (*Ploceus*), 45.
 vulcani (*Tanysiptera*), 133.
 vulgaris (*Sturnus*), 66.

 wahnesi (*Charmosyna*), 119.
 waterstradti (*Prioniturus*), 125.
 websteri (*Alcyone*), 130, 204.
 — (*Cacomantis*), 203.
 weddellii (*Aratinga*), 121.
 wetterensis (*Neopsittacus*), 120.
 whitakeri (*Garrulus*), 65.
 wilsoni (*Fregata*), 311.

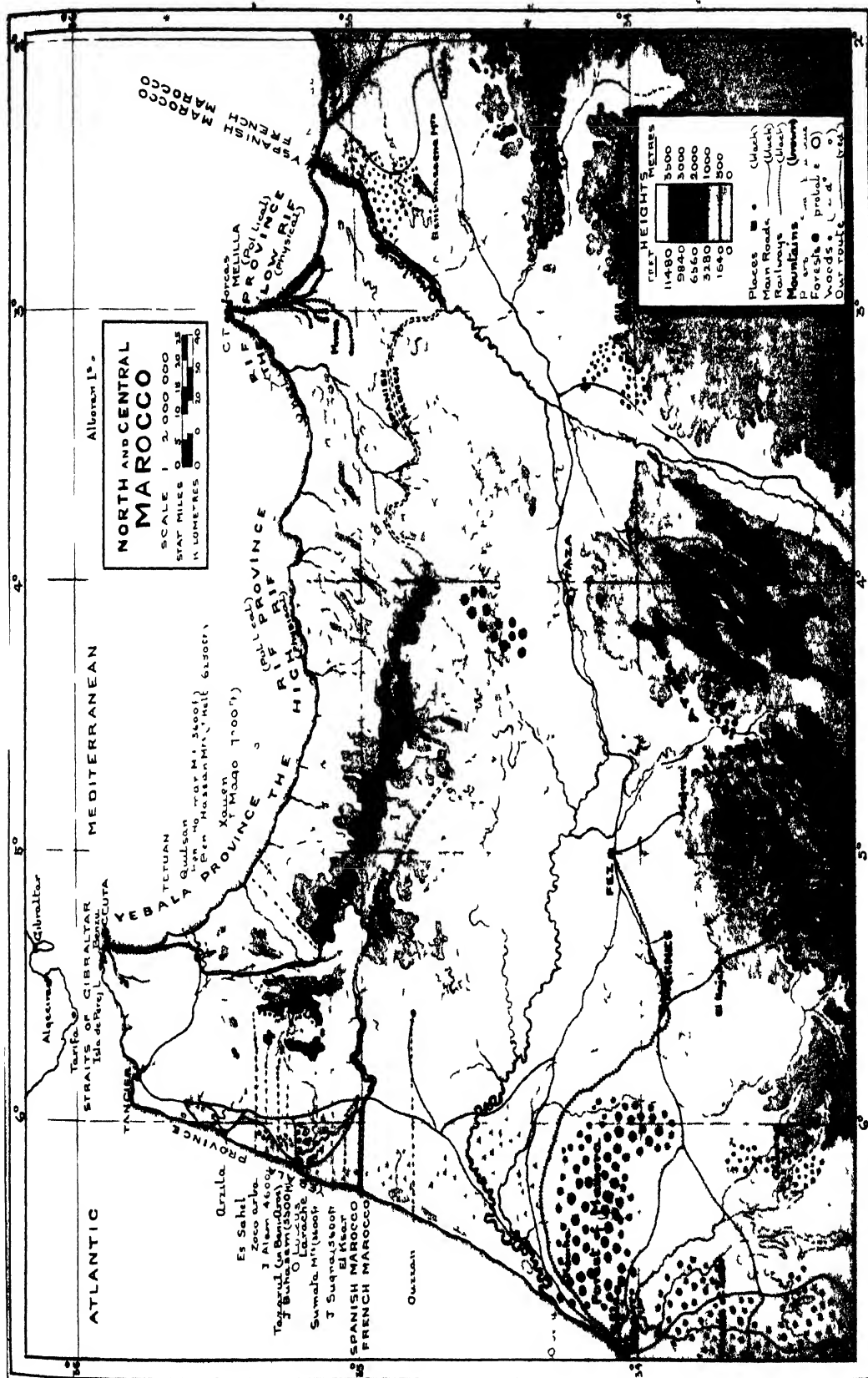
 Xenocerus, 240, 241.
 xylophagus (*Anthrabisomus*), 259.

 yalensis (*Melittophagus*), 113.
 yamdenae (*Alcyone*), 130.
 yolanthae (*Hariësis*), 293.

 zedlitzi (*Erythrospiza*), 45.
 Zosterops, 35, 211.

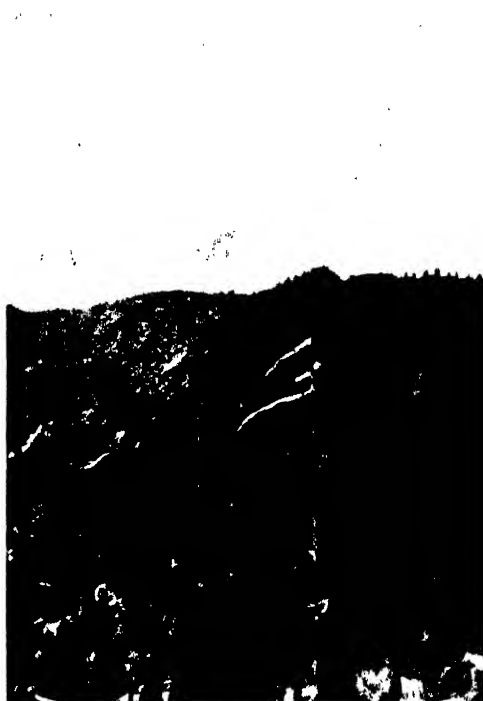
NOTICE

Professor Embrik Strand, Director of the Systematic-Zoological Institute of the University of Riga, Latvia, Kronvalda bulvars 9, is preparing a Dictionary of Entomologists, containing biographies of Entomologists and Arachnologists of all times and all countries. He asks every Entomologist and collector to send him his own biography. The publication of the work is assured.

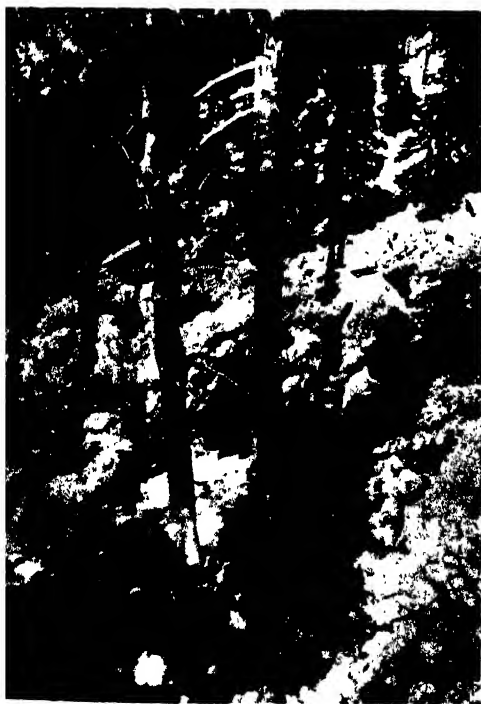




Xauen. Jebel Sugna, 5,900 ft., in distance.



Jebel Mago, 6,400 ft. In distance, J. Kelti (Mt. Anna) 6,300 ft.



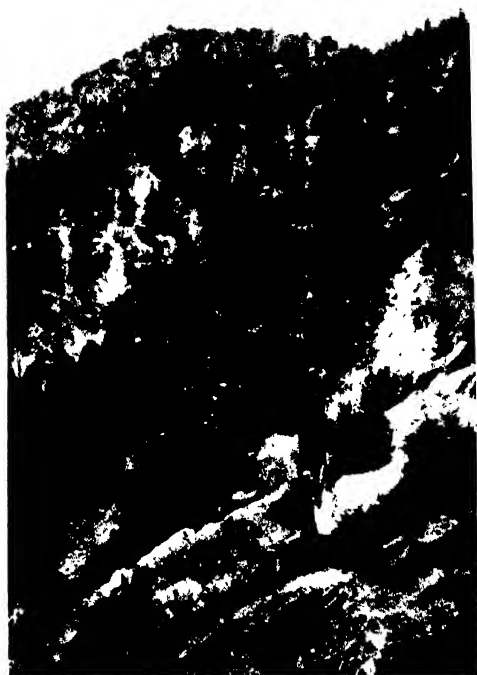
Jebel Mago, 6,400 ft., among the pinsapos.



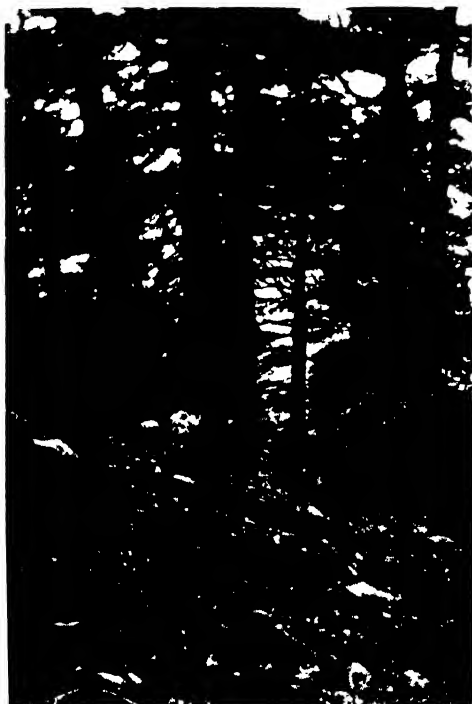
J. Mago, 6,400 ft. Exceptional pinsapos, with double and triple leaders.



J. Mago 6,400 ft., with decaying pinsapos. North Peña or twin summit, 7,200 ft., in distance



J. Mago at 6,000 ft. Pinsapo forest towards the North Peña.



J. Mago at 6,200 ft. Pinsapo forest.



J. Mago, 6,000 ft. One of the few old oaks (*Quercus ballota*) in pinsapo forest, in which first nuthatch was shot.



Beni-Aros, slopes below the forest.



Tazarut, mosque.



Tazarut. Raisuni's house inside stone wall; also tents for guards and stabling.



Tazarut. Cork oak in sacred grove; nest of Missel Thrush on low branch on left.



In the lower forest of Jebel Buhasem 4,000 ft. Trees mostly cork oak, deciduous oaks in distance.



J. Buhasem, 4,500 ft. In forest of deciduous oaks (*Quercus balota*), leaves just begin to appear 1st May.



Summit of J. Buhasem, 5,500 ft. On skyline eastwards Beni Hassan massif. Boulders here of yellow sandstone



Wide col., 5,200 ft., near summit of J. Buhasem "Moorland," richly clad with low growth of Heath, *Cistus*, *Helianthemum*, and *Genista*.

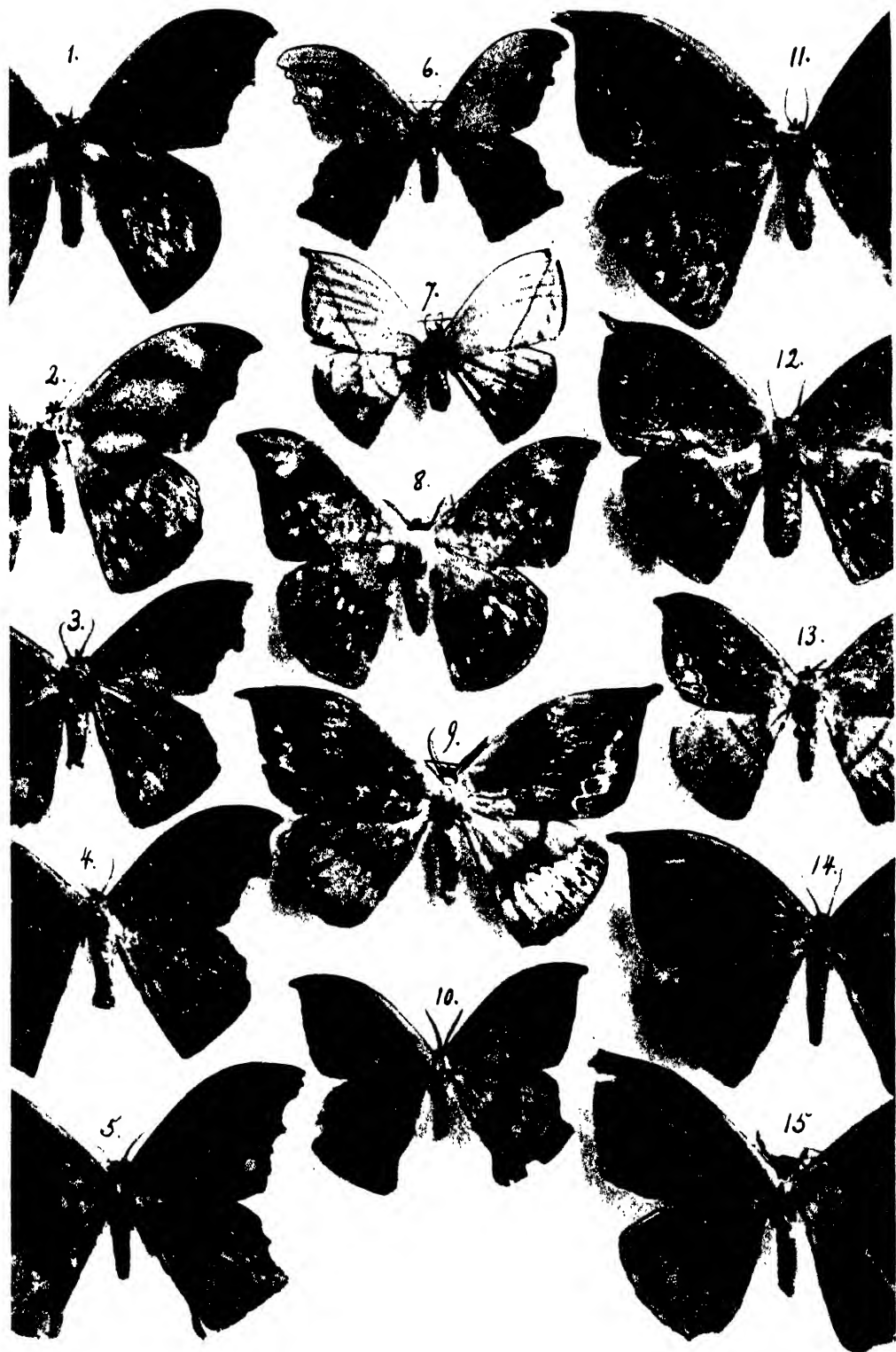
EXPLANATION OF PLATE VI.

Fig.		Page
1.	<i>Asthenidia lactucina</i> ♂	148
2.	„ <i>transversaria salax</i> ♂	141
3.	„ <i>terminalis</i> ♂	142
4.	„ <i>buckleyi buckleyi</i> ♀	149
5.	„ <i>celata</i> ♀	144
6.	„ <i>diffissa diffissa</i> ♂	145
7.	„ <i>spinicauda</i> ♂	147
8.	„ <i>podaliriaria</i> ♂	139
9.	„ <i>geometraria</i> ♀	143
10.	„ <i>amphira</i> ♂	139
11.	<i>Janiodes laverna nigropuncta</i> ♂	188
12.	„ „ „ ♀	188
13.	„ <i>russea</i> ♂	191
14.	„ <i>bethulia</i> ♂	192



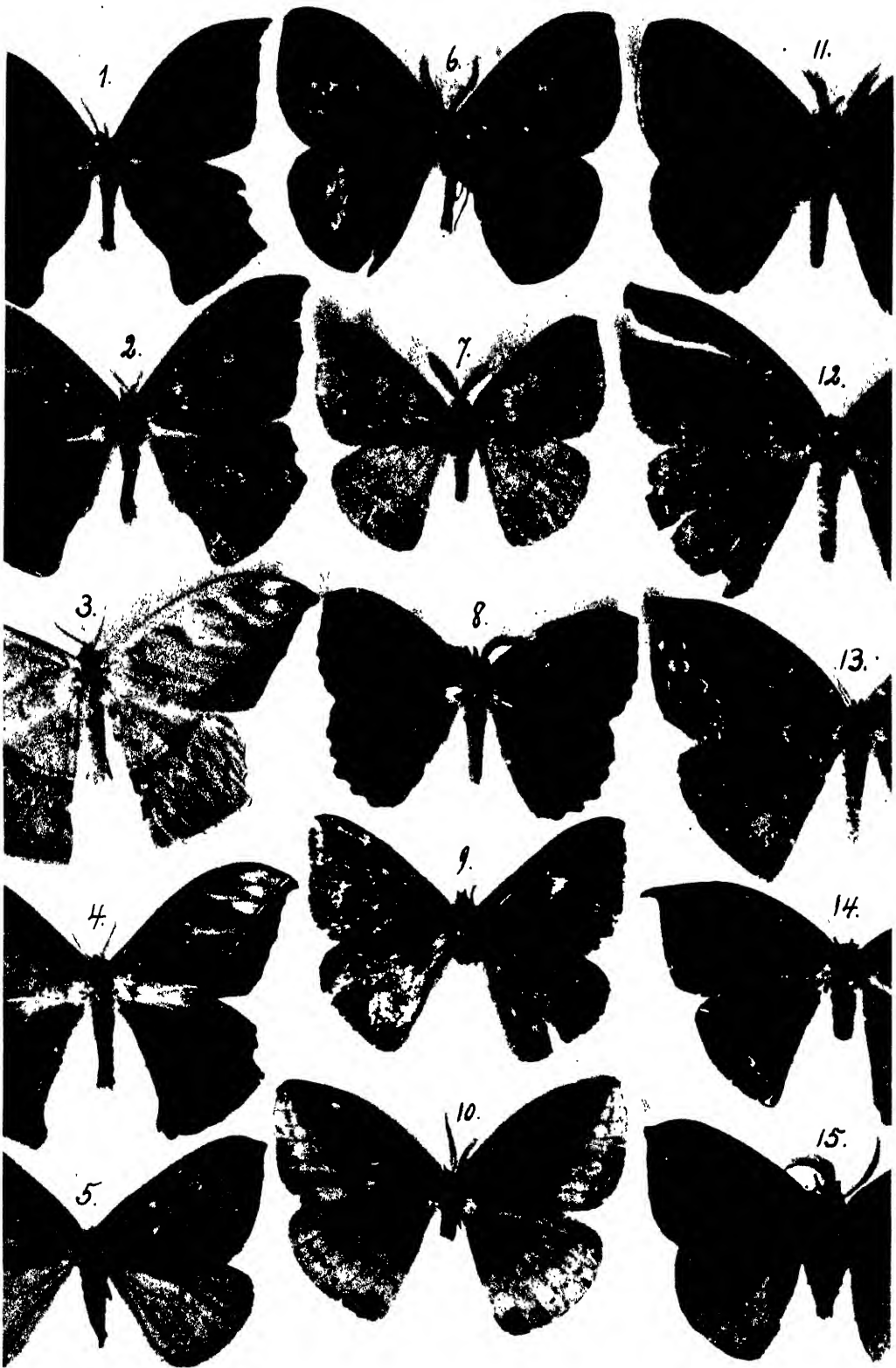
EXPLANATION OF PLATE VII.

Fig.		Page
1.	<i>Oxytenis mirabilis</i> ♂	157
2.	„ <i>naemia orecta</i> ♂	160
3.	„ <i>bicornis</i> ♂	164
4.	„ <i>leda</i> ♂	161
5.	„ <i>peregrina</i> ♂	165
6.	„ <i>angulata</i> ♂	170
7.	„ „ ♀	170
8.	„ <i>modestia</i> ♂	153
9.	<i>Homoeopteryx elegans</i> ♂	178
10.	<i>Oxytenis beprea</i> ♂	168
11.	„ <i>naemia aravaca</i> ♀	160
12.	„ <i>modestia</i> ♀	153
13.	„ <i>albilunulata</i> ♂	155
14.	„ „ ♀	155
15.	<i>Homoeopteryx major</i> ♂	177



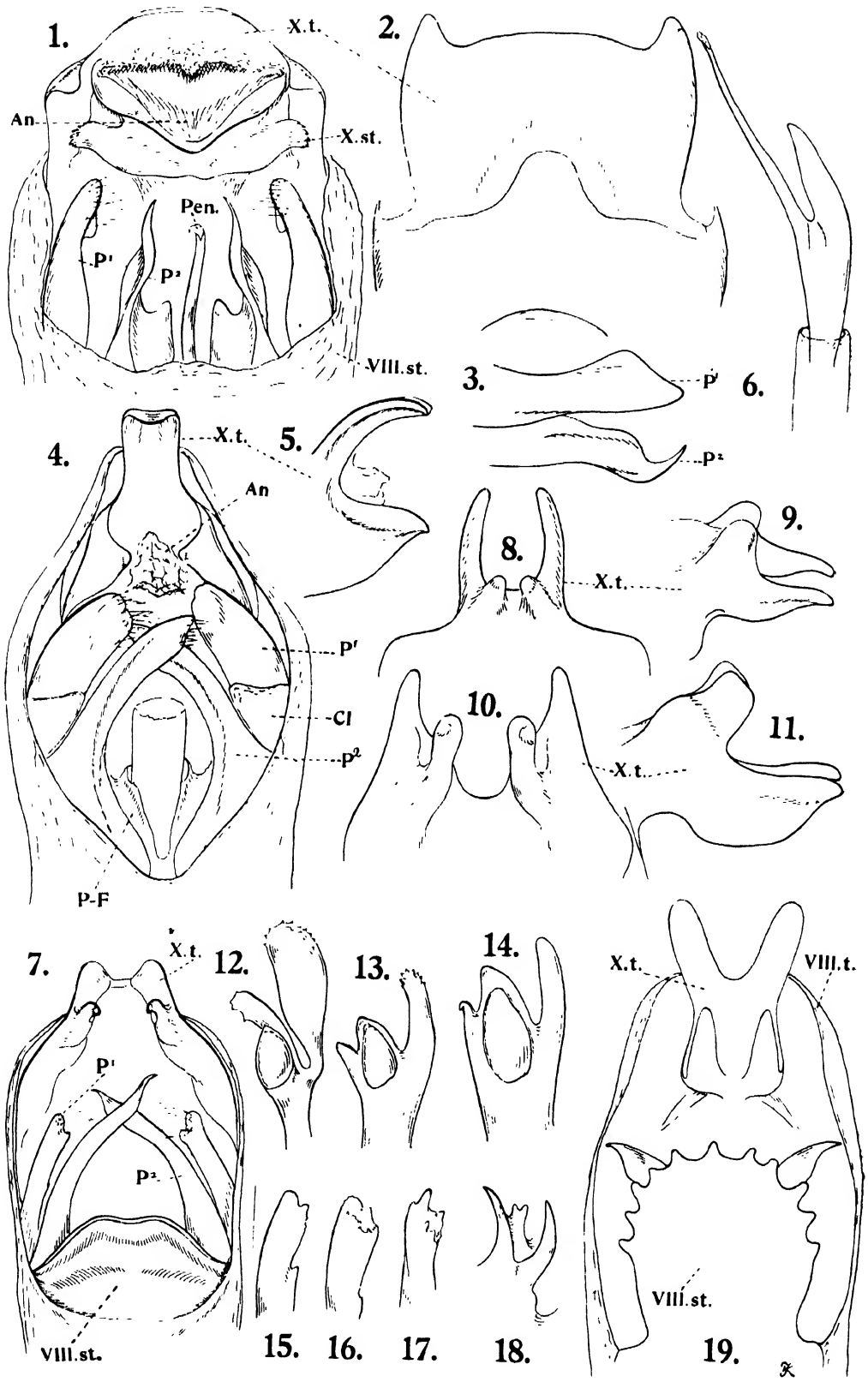
EXPLANATION OF PLATE VIII.

Fig.		Page
1.	<i>Oxytenis beprea</i> ♂, Chiriqui	168
2.	„ <i>spadix</i> ♂, type	173
3.	„ <i>gigantea</i> ♂, type	172
4.	„ „ ♂	172
5.	<i>Janiodes ecuadorensis</i> ♀	189
6.	„ <i>dognini</i> ♂, type.	188
7.	„ <i>bethulia</i> ♂, type	192
8.	„ <i>russea</i> ♂, type	191
9.	„ <i>virgata</i> ♀, type	191
10.	<i>Homoeopteryx divisa</i> ♀, type	179
11.	<i>Janiodes ecuadorensis</i> ab. <i>flexuosa</i> ♂.	189
12.	<i>Oxytenis naemia orecta</i> ♀, from Bogotá	160
13.	„ <i>leda</i> ♀, type	161
14.	„ <i>bicórnis</i> ♀.	164
15.	<i>Janiodes ecuadorensis</i> ♂, type	189



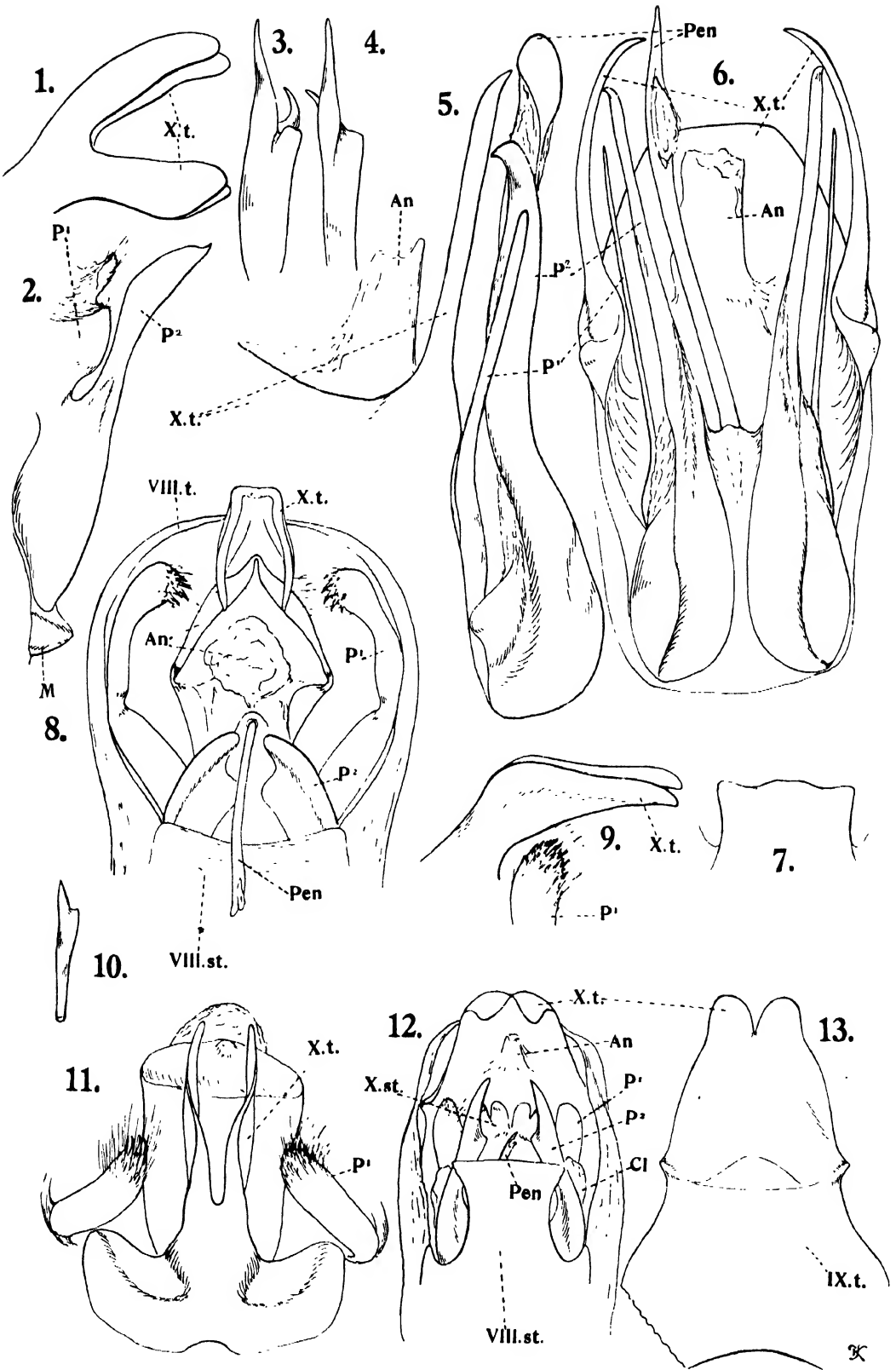
EXPLANATION OF PLATE IX.

Fig.		Page
1.	<i>Asthenidia podaliriaria</i> ♂, genitalia, ventral aspect	139
	x. t. = anal tergite; x. st. = anal sternite; An = anal cone; P ¹ and P ² = upper and lower processes of clasper; Pen = penis- sheath; viii. st. = eighth sternite.	
2.	The same; x. t., dorsal aspect	139
3.	„ the two lobes of the clasper, inner side	139
4.	<i>Asthenidia amphira</i> ♂; genitalia, ventral aspect	139
5.	„ „ anal tergite, lateral aspect	139
6.	„ „ penis-sheath with its collar	139
7.	„ <i>transversaria salax</i> ♂, genitalia, ventral aspect, Nicaragua	141
8.	„ „ „ x. t., dorsal aspect	141
9.	„ „ „ x. t., lateral aspect	141
10.	„ <i>transv. columbiana</i> ♂, x. t., dorsal aspect, Muzo	142
11.	„ „ „ x. t., lateral aspect	142
12.	„ „ <i>salax</i> ♂, penis-sheath	141
13.	„ „ <i>transversaria</i> ♂, penis-sheath, Chiriqui	142
14.	„ „ <i>columbiana</i> ♂, penis-sheath	142
15.	„ „ <i>salax</i> ♂, upper process of clasper, Nicaragua	141
16.	„ „ „ ♂, „ „ Costa Rica	141
17.	„ „ <i>transversaria</i> ♂, „ „	142
18.	„ „ <i>columbiana</i> ♂, „ „	142
19.	„ <i>terminalis</i> ♂, genitalia	142



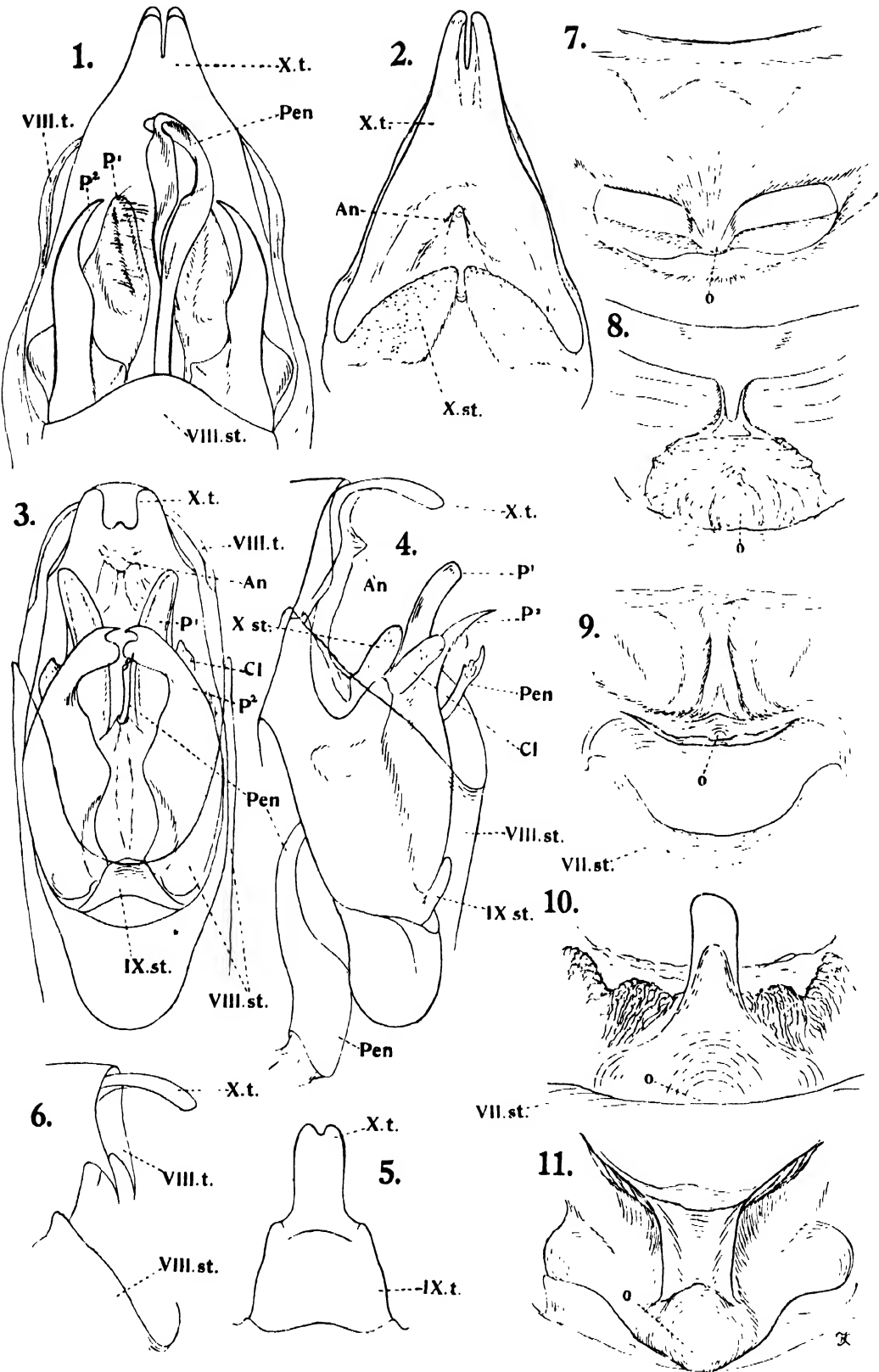
EXPLANATION OF PLATE X.

Fig.		Page
1.	<i>Asthenidia terminalis</i> ♂, anal tergite, lateral aspect . . .	142
2.	„ „ „ clasper, externo-lateral aspect . . .	142
3.	„ „ „ penis-sheath, ventral aspect . . .	142
4.	„ „ „ „ sinistro-lateral aspect . . .	142
5.	„ „ <i>geometraria</i> ♂, genitalia, lateral aspect, Pará . . .	143
6.	„ „ „ „ ventral aspect . . .	143
7.	„ „ „ „ viii. st.	143
8.	„ „ <i>celata</i> ♂, genitalia, ventral aspect . . .	144
9.	„ „ „ „ anal tergite, lateral aspect . . .	144
10.	„ „ „ „ penis-sheath	144
11.	„ „ „ „ genitalia, dorsal aspect . . .	144
12.	„ „ <i>lactucina</i> ♂, genitalia, ventral aspect . . .	148
13.	„ „ „ „ ix. t. and x. t., dorsal aspect	148



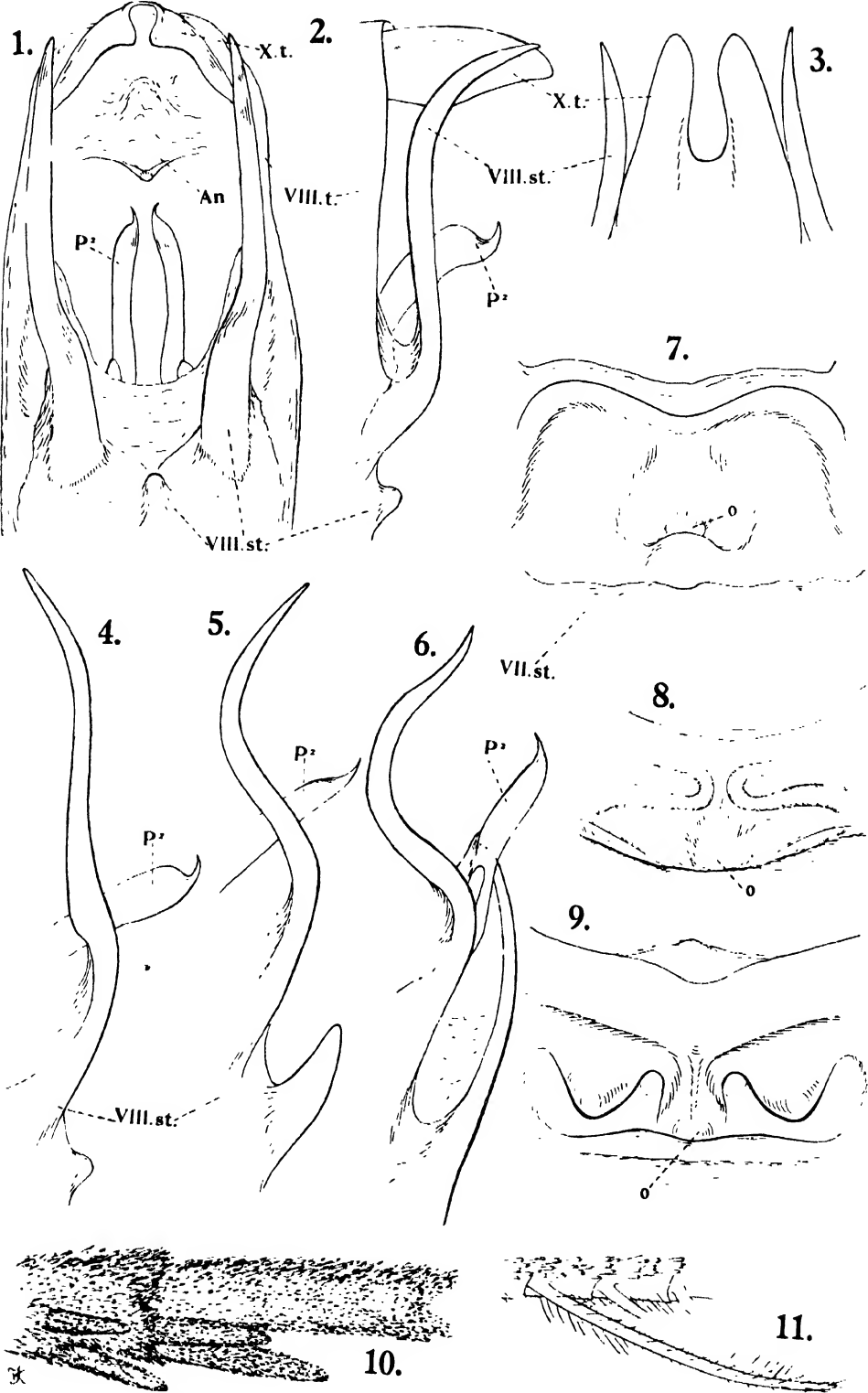
EXPLANATION OF PLATE XI.

Fig.		Page
1.	<i>Asthenidia buckleyi</i> ♂, genitalia, ventral aspect	149
2.	„ „ anal segment, ventral aspect	149
3.	„ <i>stricturaria</i> ♂, genitalia, ventral aspect, Surinam	146
4.	„ „ „ lateral aspect	146
5.	„ „ anal tergite, dorsal aspect	146
6.	„ <i>spinicauda</i> , eighth segment, lateral aspect	147
7.	„ <i>geometraria</i> ♀, genital sclerite	143
	o = aperture.	
8.	„ <i>amphira</i> ♀, genital sclerite	139
9.	„ <i>transversaria columbiana</i> ♀, genital sclerite	142
10.	„ <i>paulina</i> ♀, genital sclerite	144
11.	„ <i>celata</i> ♀, genital sclerite	144



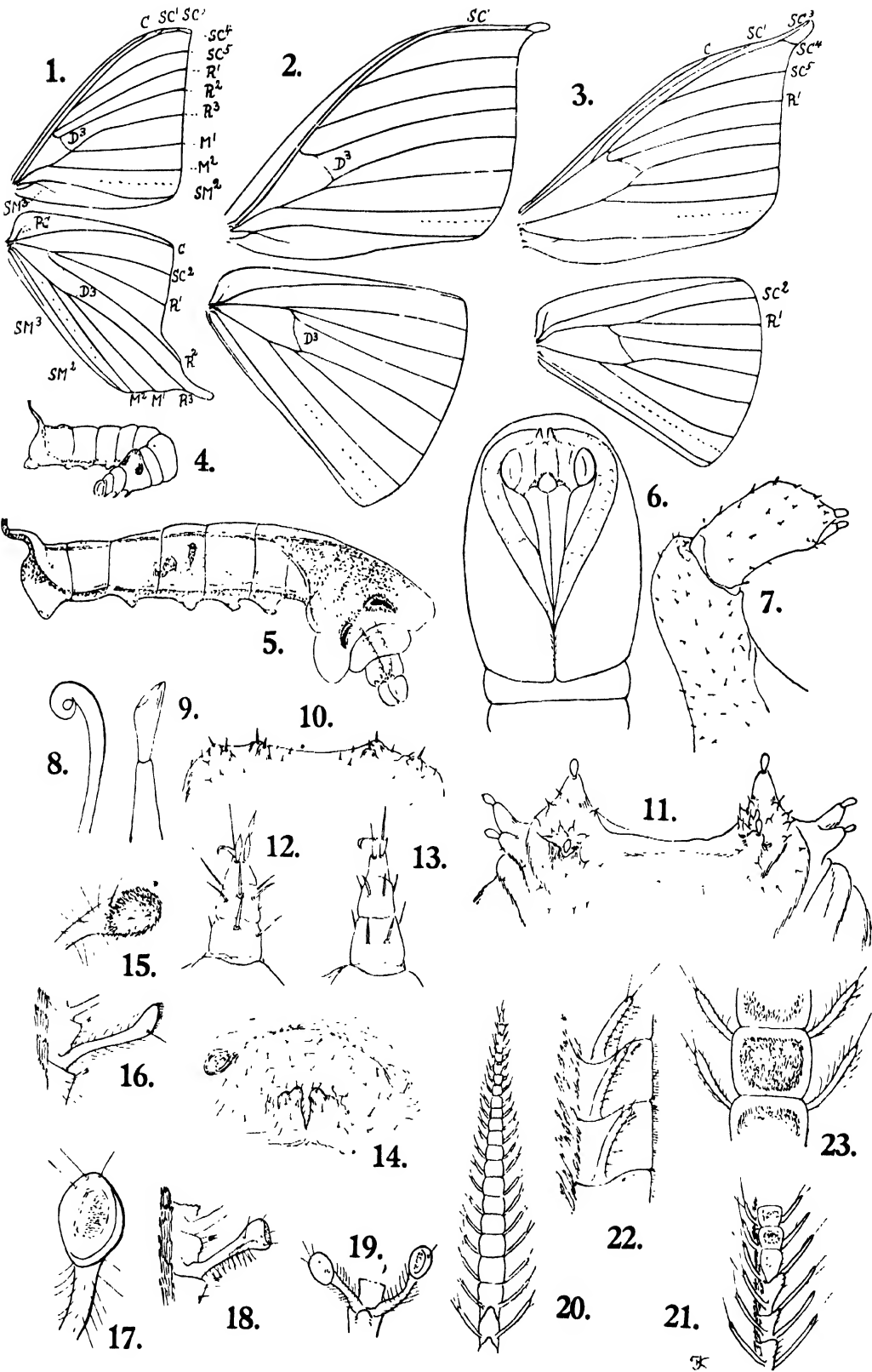
EXPLANATION OF PLATE XII.

Fig.		Page
1.	<i>Asthenidia diffissa diffissa</i> ♂, genitalia, ventral aspect	145
2.	„ „ „ „ „ lateral aspect	145
3.	„ „ „ „ „ anal tergite and processes of viii. st., dorsal aspect	145
4.	<i>Asthenidia diffissa fortis</i> ♂, process of viii. st. and P ¹ of clasper, lateral aspect	146
5.	<i>Asthenidia diffissa inca</i> ♂, process of viii. st. and P ² of clasper, lateral aspect	146
6.	<i>Asthenidia diffissa tridens</i> ♂, process of viii. st. and P ¹ of clasper, lateral aspect	146
7.	<i>Asthenidia diffissa diffissa</i> ♀, genital sclerite	145
8.	„ <i>lactucina</i> ♀, genital sclerite	148
9.	„ <i>buckleyi</i> ♀, genital sclerite	149
10.	„ <i>amphira</i> ♂, spurs of hindtibia	139
11.	„ <i>podaliriaria</i> ♂, antenna, lateral aspect	139



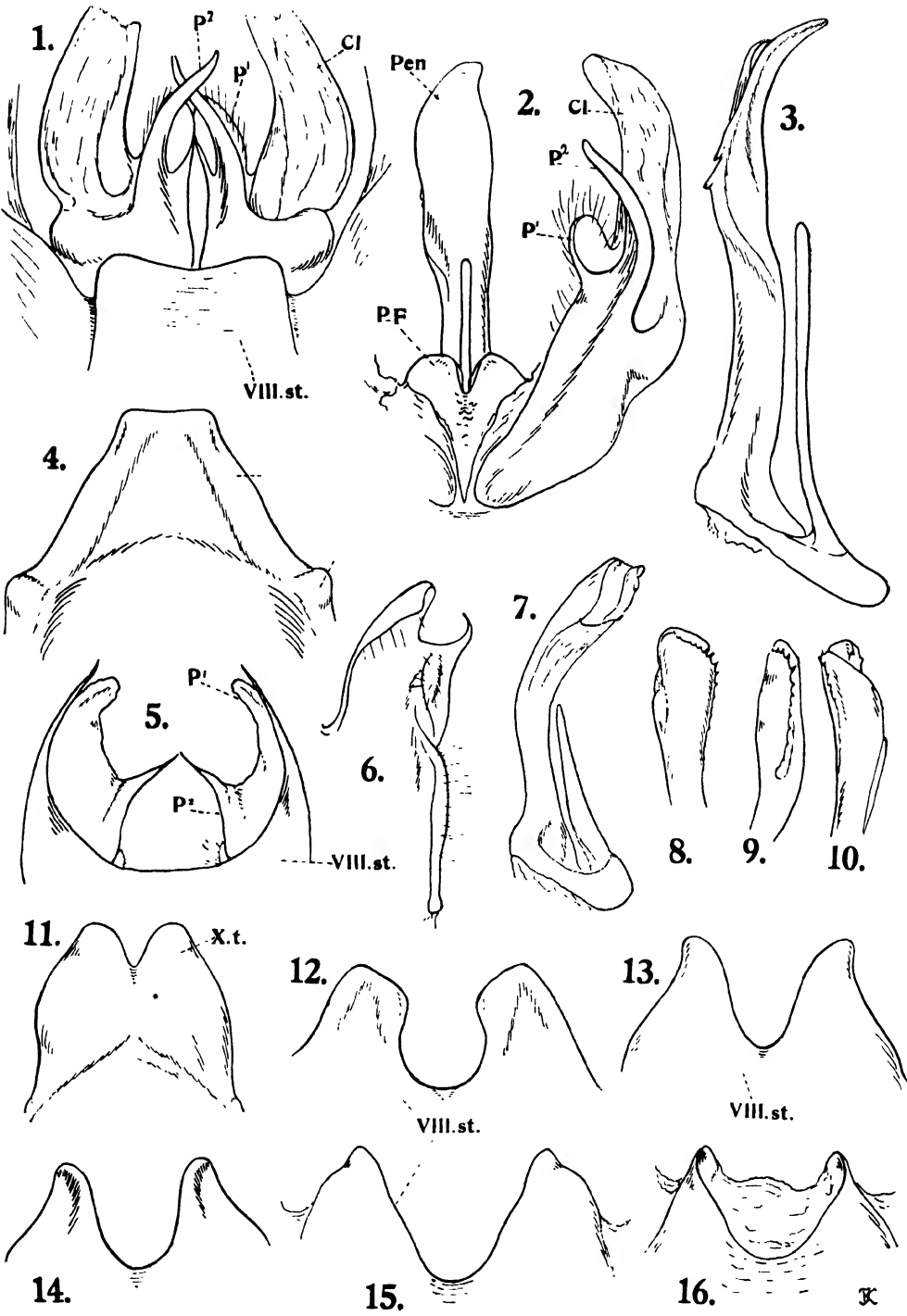
EXPLANATION OF PLATE XIII.

Fig.		Page
1.	<i>Asthenidia podaliriaria</i> ♂, neuration	139
2.	<i>Oxytenis modestia</i> ♀, neuration	153
3.	<i>Homoeopteryx elegans</i> ♂, neuration	178
4.	<i>Asthenidia lactucina</i> , larva	148
5.	<i>Oxytenis modestia</i> , larva	153
6.	„ „ <i>naemia</i> , pupa, ♀	158
7.	„ „ „ tail of larva	158
8.	„ „ „ involute bristle from cremaster of pupa	158
9.	„ „ „ tubercle with spine of larva	158
10.	<i>Asthenidia lactucina</i> , pronotum of larva	148
11.	<i>Oxytenis naemia</i> , „ „ „ „	158
12.	<i>Asthenidia lactucina</i> , metathoracic leg of larva, from inner side	148
13.	<i>Oxytenis naemia</i> , „ „ „ „	158
14.	<i>Asthenidia lactucina</i> , metanotum of larva	148
15.	<i>Oxytenis albilunulata</i> ♀, branch of antenna, end-surface	155
16.	„ „ „ „ lateral aspect	155
17.	„ „ <i>peregrina</i> ♀, „ „ end-surface	165
18.	„ „ „ „ lateral aspect	165
19.	„ „ „ „ ventral aspect	165
20.	<i>Homoeopteryx malecena</i> ♀, distal portion of antenna, ventral aspect	176
21.	„ „ „ „ some segments in semilateral aspect	176
22.	„ „ „ „ in lateral aspect	176
23.	„ „ „ „ in ventral aspect	176



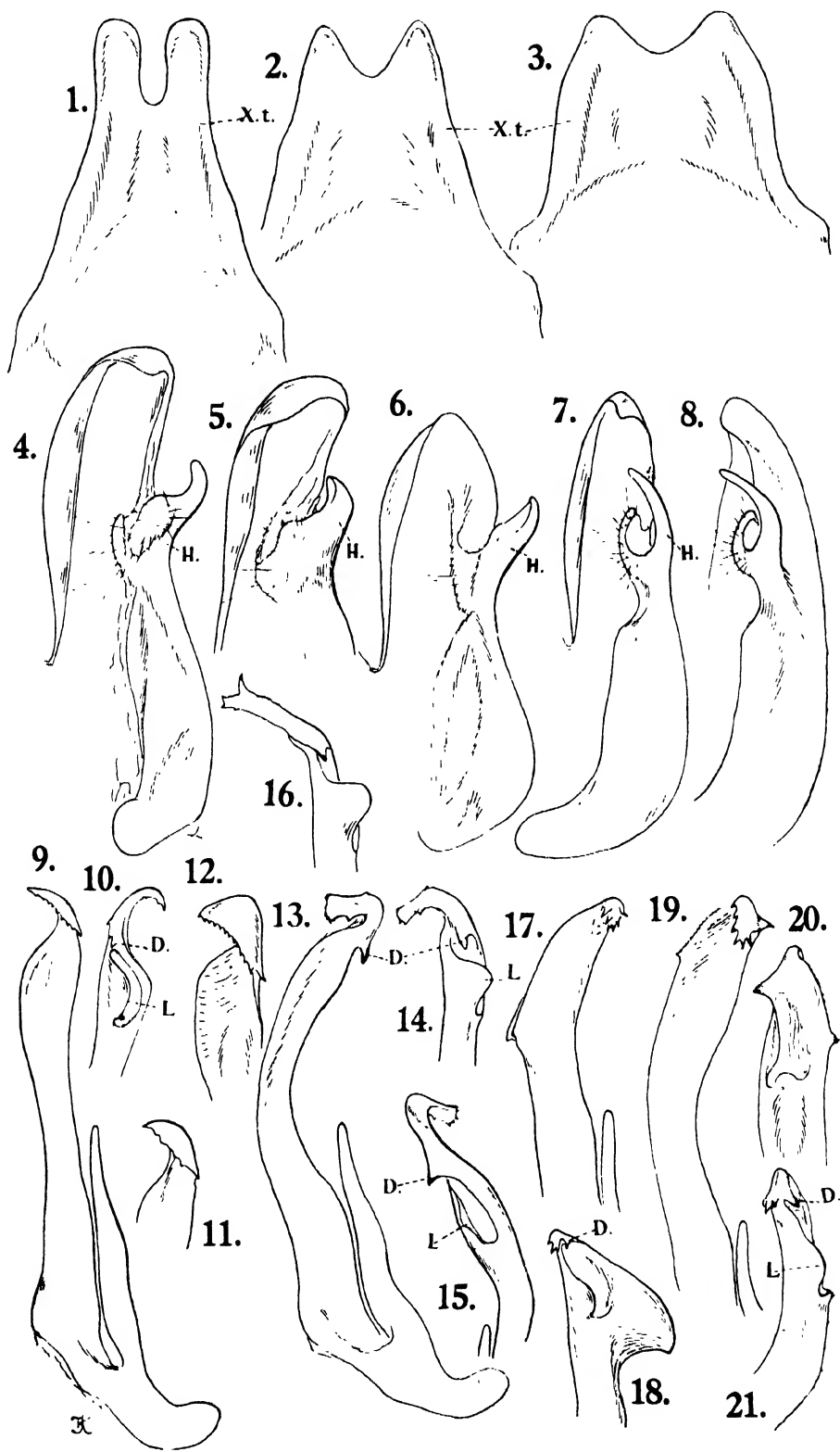
EXPLANATION OF PLATE XIV.

Fig.		Page
1.	<i>Oxytenis modestia</i> ♂, eighth sternite and claspers, ventral aspect .	153
2.	„ „ clasper from inner side, penis-sheath and penis-funnel	153
3.	„ „ penis-sheath from left side	153
4.	„ „ anal tergite	153
5.	„ <i>albilunulata</i> ♂, eighth sternite and claspers	155
6.	„ „ clasper from inner side	155
7.	„ „ penis-sheath, from left side	155
8.	„ „ „ from ventral side	155
9.	„ „ „ from right side	155
10.	„ „ „ from dorsal side	155
11.	„ „ anal tergite	155
12.	„ <i>mirabilis</i> ♂, eighth sternite	157
13.	„ <i>sobrina</i> ♂, „ „	158
14.	„ <i>naemia</i> ♂, „ „	159
15.	„ <i>leda</i> ♂, „ „	161
16.	„ <i>nubila</i> ♂, „ „	163



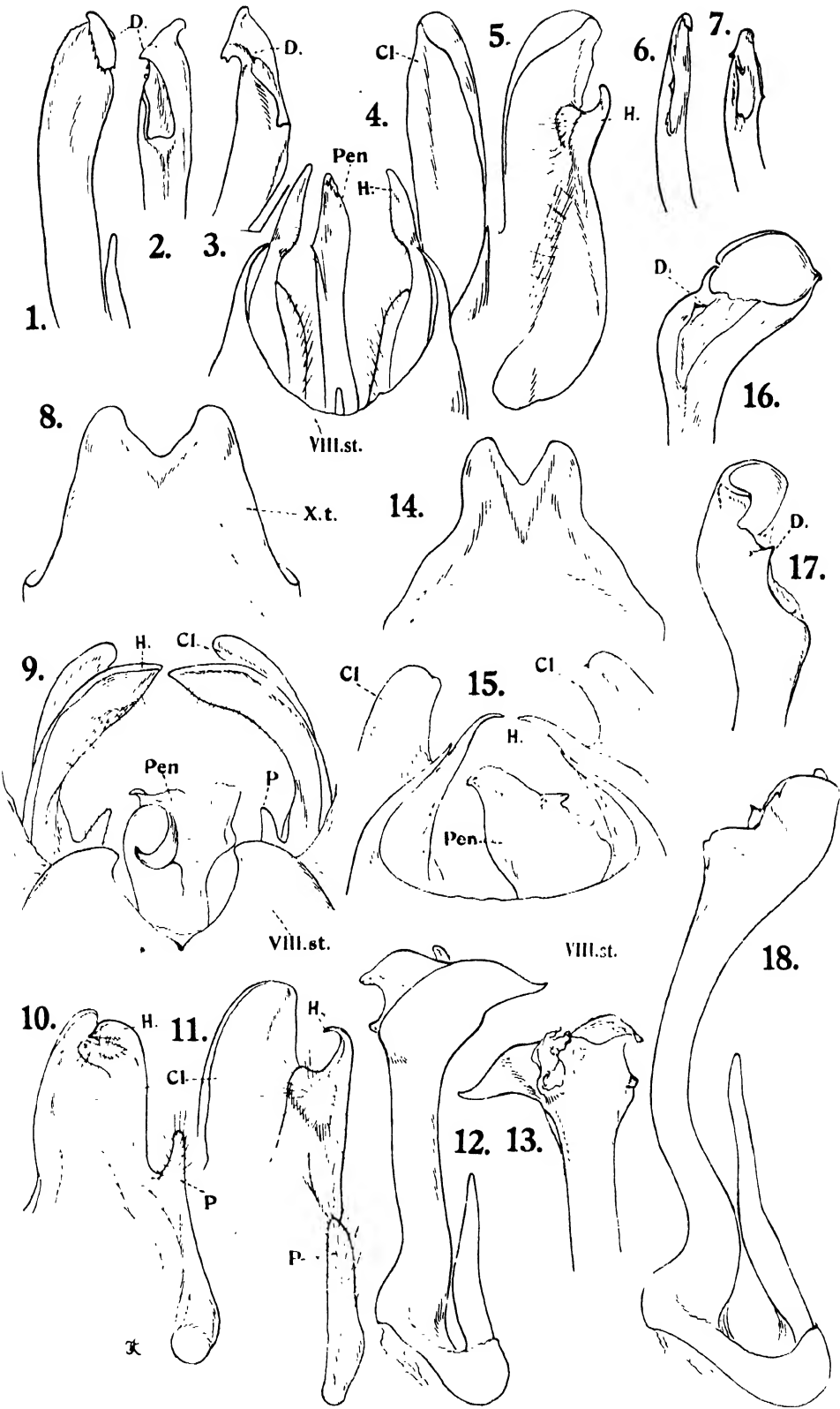
EXPLANATION OF PLATE XV.

Fig.		Page
1.	<i>Oxytenis mirabilis</i> ♂, anal tergite, dorsal aspect	157
2.	„ <i>naemia</i> ♂, „ „ „	158
3.	„ <i>leda</i> ♂, „ „ „	161
4.	„ <i>mirabilis</i> ♂, clasper from inside	157
5.	„ <i>sobrina</i> ♂, „ „	158
6.	„ <i>leda</i> ♂, „ „	161
7.	„ <i>nubila</i> ♂, „ „	163
8.	„ „ „ ventral inside	163
9.	„ <i>mirabilis</i> ♂, penis-sheath, from left side	157
10.	„ „ „ „ right side, another specimen	157
11.	„ „ „ „ left side, another specimen	157
12.	„ <i>sobrina</i> ♂, „ „ ventral side	158
13.	„ <i>naemia naemia</i> ♂, „ „ left side	161
14.	„ „ „ „ ventral side	161
15.	„ „ „ „ right side	161
16.	„ „ <i>orecta</i> „ „ ventral side	160
17.	„ <i>leda</i> ♂, „ „ left side	161
18.	„ „ „ „ ventral side	161
19.	„ <i>erosa</i> ♂ „ „ left side	163
20.	„ „ „ „ dorsal side	163
21.	„ „ „ „ right side	163



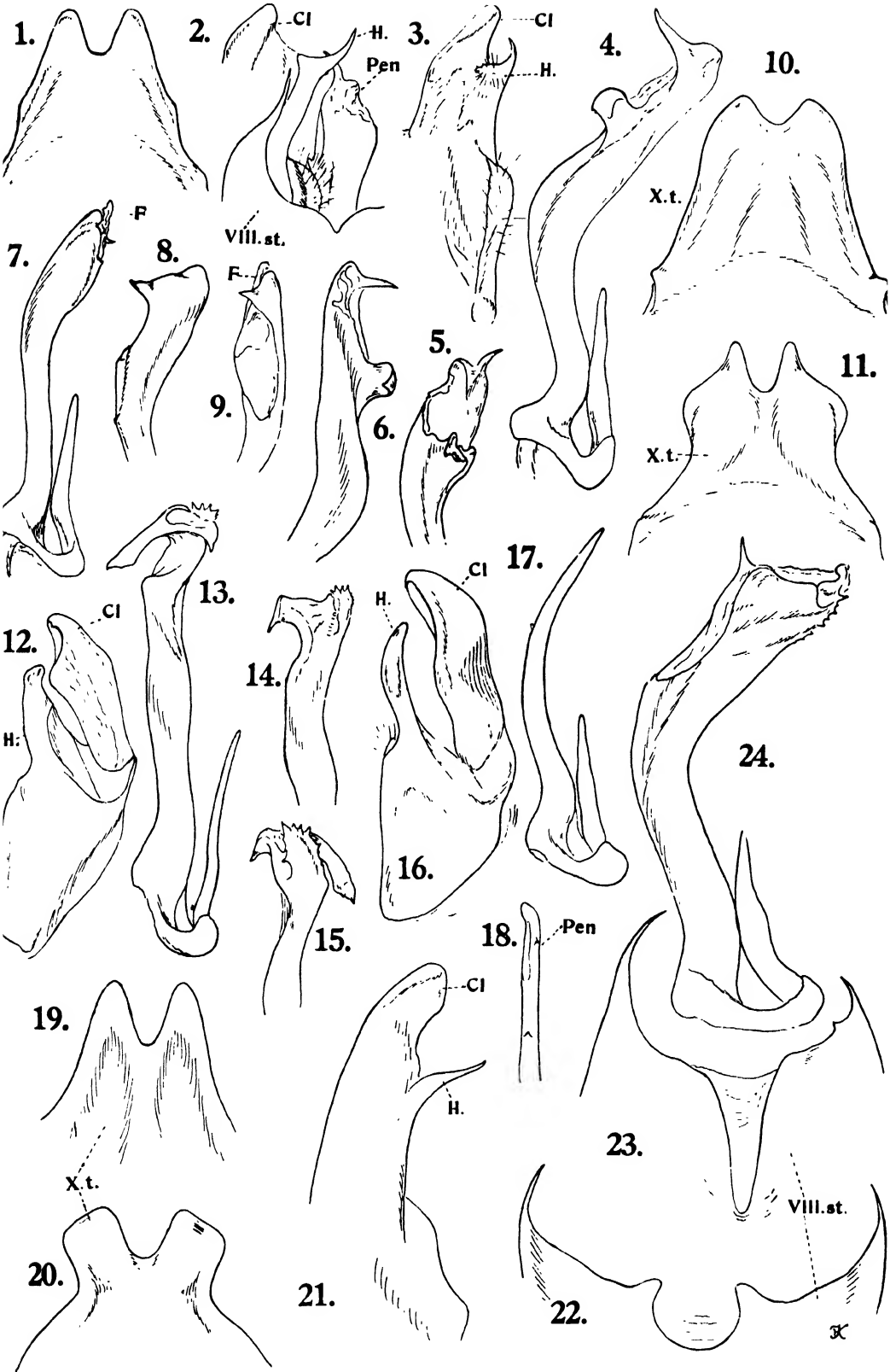
EXPLANATION OF PLATE XVI.

Fig.		Page
1.	<i>Oxytenis nubila</i> ♂, penis-sheath, from left side	163
2.	„ „ „ „ dorsal side	163
3.	„ „ „ „ ventral side	163
4.	„ <i>bicornis</i> ♂, „ „ „ „ viii. st. and claspers	164
5.	„ „ „ „ „ „ clasper, from inside	164
6.	„ „ „ „ „ „ penis-sheath, from right side	164
7.	„ „ „ „ „ „ „ „ dorsal side	164
8.	„ <i>peregrina</i> ♂, anal tergite, from dorsal side	165
9.	„ „ „ „ „ „ claspers, vii. st. and apex of penis-sheath	165
10.	„ „ „ „ „ „ „ „ from inner side	165
11.	„ <i>epiphaea</i> ♂, clasper, from inner side	166
12.	„ <i>peregrina</i> ♂, penis-sheath, from left side	165
13.	„ „ „ „ „ „ „ „ right side	165
14.	„ <i>epiphaea</i> ♂, anal tergite, from dorsal side	166
15.	„ „ „ „ „ „ claspers, vii. st. and apex of penis-sheath	166
16.	„ „ „ „ „ „ penis-sheath, from dorsal side	166
17.	„ „ „ „ „ „ „ „ right side	166
18.	„ „ „ „ „ „ „ „ left side	166



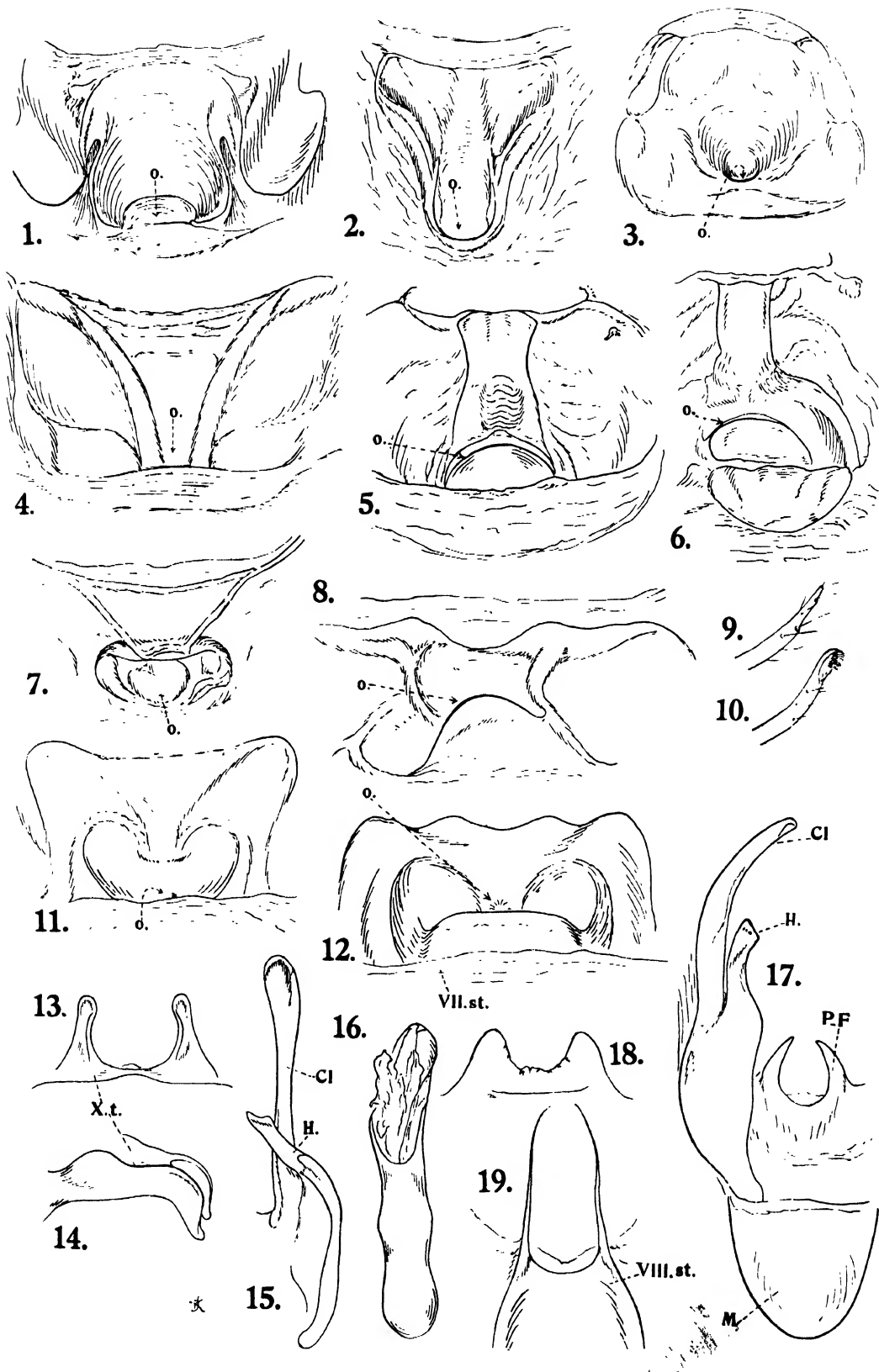
EXPLANATION OF PLATE XVII.

Fig.		Page
1.	<i>Oxytenis plettina</i> ♂, anal tergite, from dorsal side . . .	167
2.	„ „ clasper, viii. st. and penis-sheath. . .	167
3.	„ „ „ from inner side . . .	167
4.	„ „ penis-sheath, from left side. . .	167
5.	„ „ „ „ dorsal side . . .	167
6.	„ „ „ „ right side . . .	167
7.	„ <i>beprea</i> „ „ left side. . .	168
8.	„ „ „ „ dorsal side . . .	168
9.	„ „ „ „ right side . . .	168
10.	„ <i>angulata</i> ♂, anal tergite . . .	170
11.	„ <i>ferruginea</i> ♂, anal tergite . . .	171
12.	„ <i>angulata</i> ♂, clasper . . .	170
13.	„ „ penis-sheath, from left side . . .	170
14.	„ „ „ „ ventral side . . .	170
15.	„ „ „ „ right side . . .	170
16.	„ <i>ferruginea</i> , clasper . . .	171
17.	„ „ penis-sheath, from left side. . .	171
18.	„ „ „ „ dorsal side . . .	171
19.	„ <i>spadix</i> ♂, anal tergite . . .	173
20.	„ <i>gigantea</i> ♂, anal tergite . . .	172
21.	„ „ clasper, from inside . . .	172
22.	„ „ eighth sternite . . .	172
23.	„ <i>spadix</i> , „ „ . . .	173
24.	„ <i>gigantea</i> , penis-sheath, from left side . . .	172



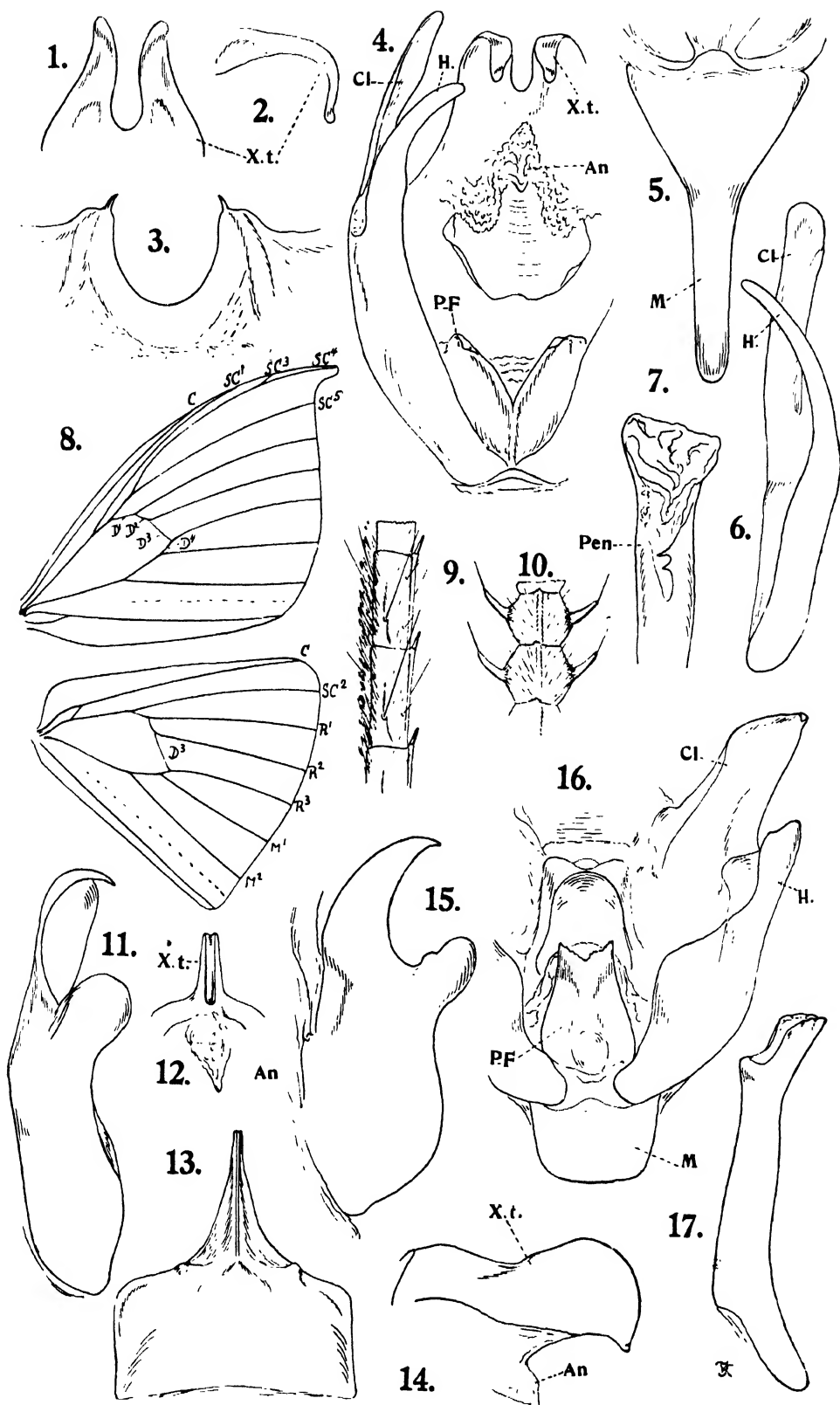
EXPLANATION OF PLATE XVIII.

Fig.		Page
1.	<i>Oxytenis modestia</i> ♀, genital sclerite	153
2.	„ <i>angulata</i> ♀, „ „	170
3.	„ <i>ferruginea</i> ♀, „ „	171
4.	„ <i>naemia</i> ♀, „ „	158
5.	„ <i>peregrina</i> ♀, „ „	165
6.	„ „ „ „	165
7.	„ <i>albilunulata</i> „ „	155
8.	„ <i>epiphaea</i> ♀, „ „	166
9.	„ <i>naemia</i> ♀, branch of antenna	158
10.	„ <i>leda</i> ♀, „ „	161
11.	„ <i>bicornis</i> , genital sclerite	164
12.	<i>Homoeopteryx major</i> ♀, genital sclerite	177
13.	„ <i>malecena prona</i> ♂, anal tergite, dorsal aspect	177
14.	„ „ „ „ „ lateral aspect	177
15.	„ „ <i>malecena</i> ♂, clasper, from inner side	177
16.	„ „ „ penis-sheath	177
17.	„ „ „ clasper and penis-funnel, from ventral side	177
18.	„ <i>major</i> ♂, penis-funnel	177
19.	„ „ eighth sternite	177



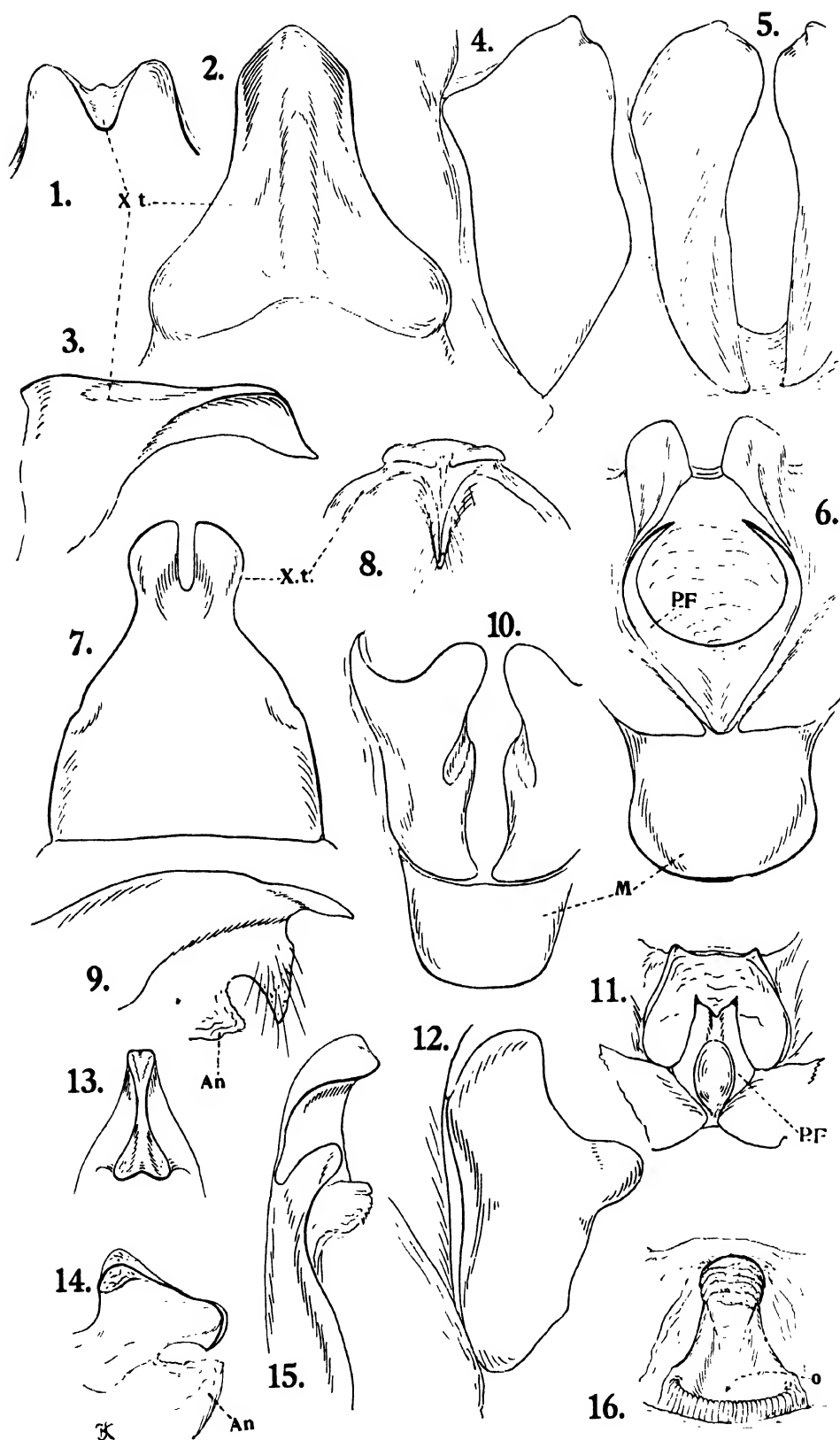
EXPLANATION OF PLATE XIX.

Fig.		Page
1.	<i>Homoeopteryx elegans</i> ♂, anal tergite, dorsal aspect	178
2.	" " " " " lateral aspect	178
3.	" " " " " eighth sternite	178
4.	" " " " " clasper, anal tergite, and penis-funnel	178
5.	" " " " " manubrium (= saccus) of ninth sternite	178
6.	" " " " " clasper	178
7.	" " " " " penis-sheath, from ventral side	178
8.	<i>Janiodes laverna</i> ♀, neuration	187
9.	<i>Janiodes ecuadorensis</i> ♀, segments 8 and 9 of antenna, lateral aspect	189
10.	<i>Microdulia mirabilis</i> ♀, " " " " ventral "	185
11.	<i>Janiodes laverna nigropuncta</i> ♂, clasper, ventral aspect	187
12.	" " " " " anal tergite, ventral aspect	187
13.	" " " " " " dorsal aspect	187
14.	" " " " " " lateral aspect	187
15.	" " " " ♂, clasper, from outer side	187
16.	" " " " " genitalia	187
17.	" " " " " penis-sheath, from left side	187



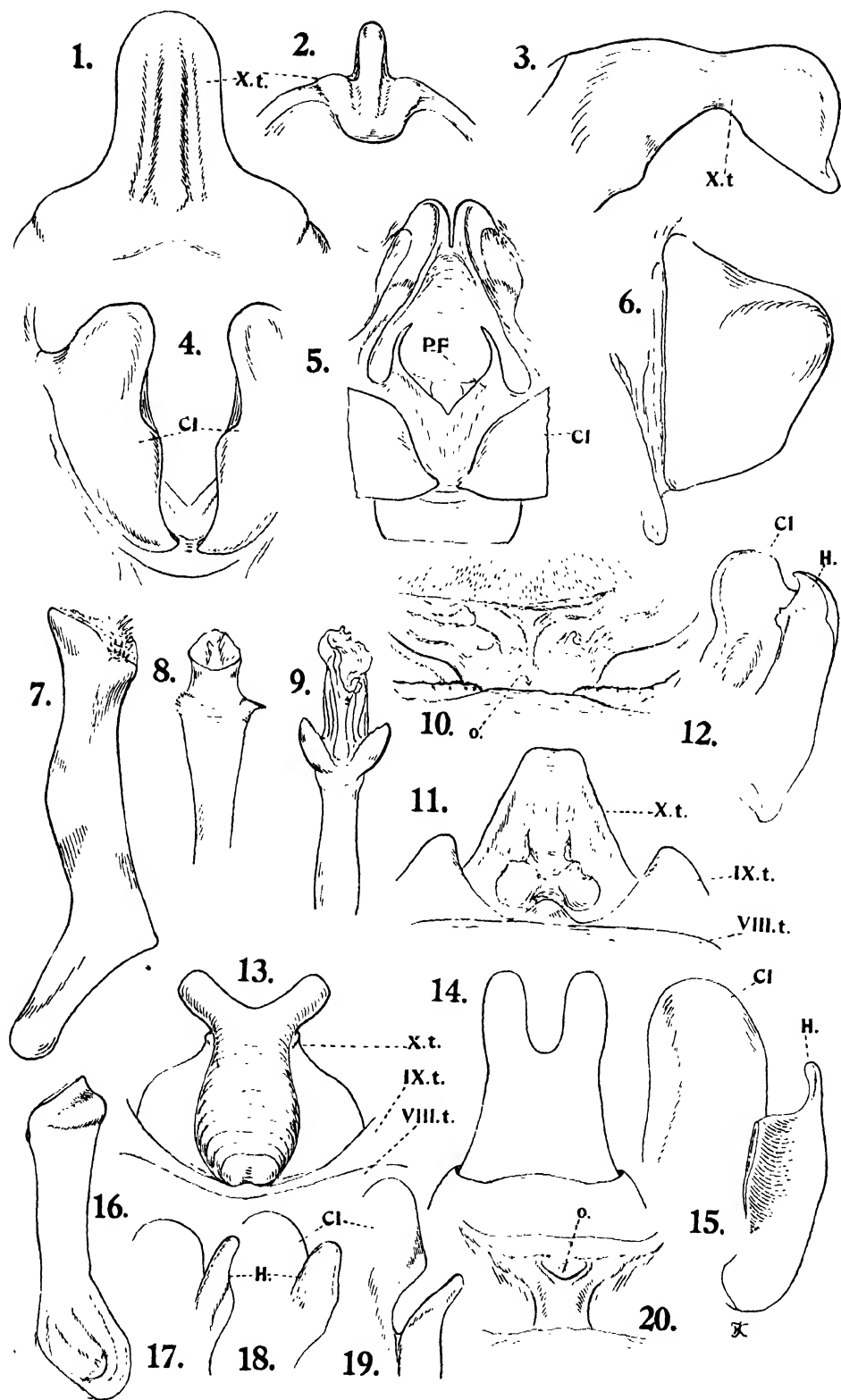
EXPLANATION OF PLATE XX.

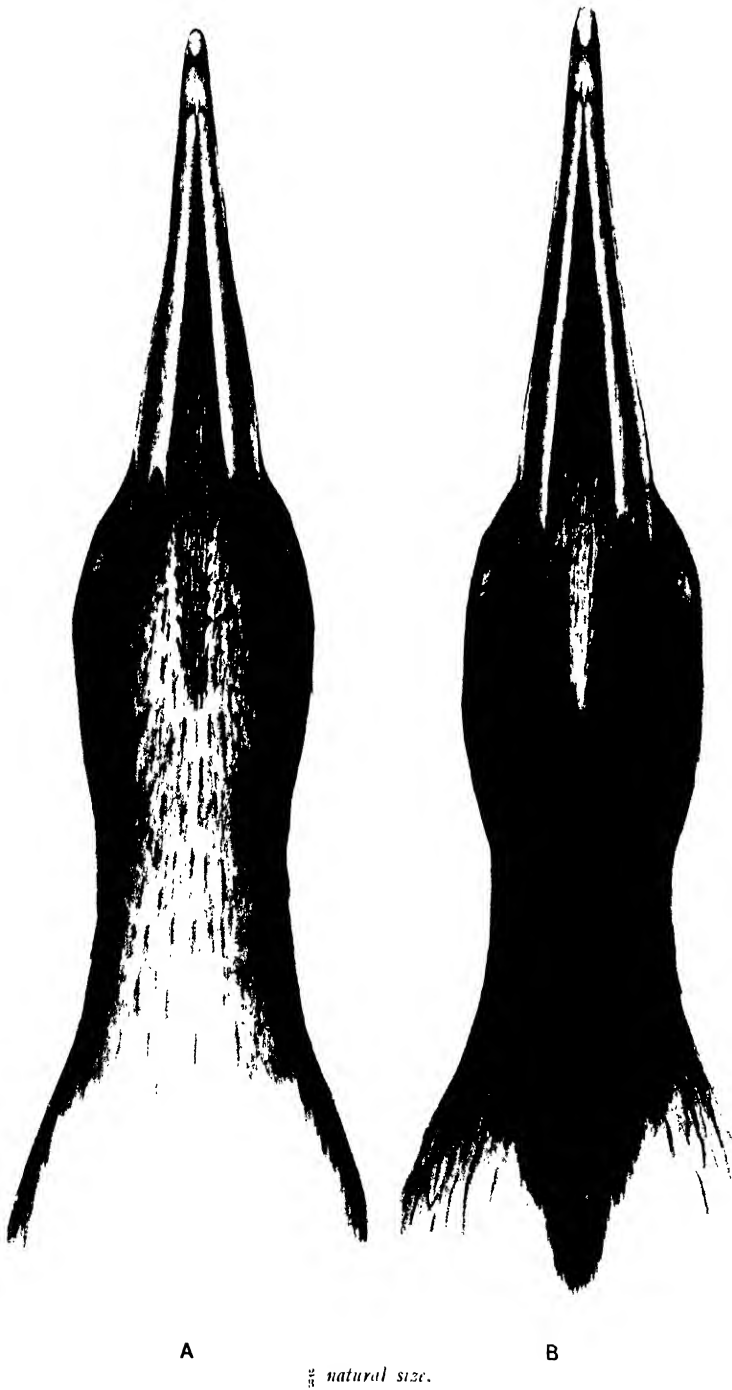
Fig.		Page
1.	<i>Janiodes ecuadorensis</i> ♂, anal tergite, ventral aspect	189
2.	„ „ „ „ dorsal aspect	189
3.	„ „ „ „ lateral aspect	189
4.	„ „ clasper, from outer side	189
5.	„ „ „ „ ventral side	189
6.	„ „ penis-funnel and manubrium of claspers	189
7.	„ <i>russea</i> ♂, dorsal aspect	191
8.	„ „ subventral apical aspect	191
9.	„ „ lateral aspect	191
10.	„ „ claspers	191
11.	„ „ penis-funnel	191
12.	„ „ clasper, from outer side	191
13.	„ <i>dognini</i> ♂, anal tergite, dorsal aspect	188
14.	„ „ „ „ lateral aspect	188
15.	„ „ clasper, ventral aspect	188
16.	„ <i>ecuadorensis</i> ♀, genital sclerite	189



EXPLANATION OF PLATE XXI.

Fig.		Page
1.	<i>Janiodes bethulia</i> ♂, anal tergite, dorsal aspect	192
2.	„ „ „ „ ventral apical aspect	192
3.	„ „ „ „ lateral aspect	192
4.	„ „ claspers, ventral aspect	192
5.	„ „ penis-funnel	192
6.	„ „ clasper, from outer side	192
7.	„ <i>ecuadorensis</i> ♂, penis-sheath, from right side	189
8.	„ <i>russea</i> ♂, „ „ dorsal side	191
9.	„ <i>bethulia</i> ♂, „ „ dorsal side	192
10.	„ <i>laverna nigropuncta</i> ♀, genital sclerite	188
11.	<i>Cercophana frauenfeldi</i> ♂, anal tergite, dorsal aspect	182
12.	„ „ clasper, from inside	182
13.	„ <i>venusta</i> ♂, anal tergite, dorsal aspect	183
14.	<i>Neocercophana philippii</i> ♂, anal tergite, dorsal aspect	184
15.	„ „ clasper, from inside	184
16.	<i>Cercophana venusta</i> ♂, penis-sheath, on left side	183
17.	„ <i>frauenfeldi</i> ♂, clasper and harpe, from ventral side	182
18.	„ <i>venusta</i> ♂, „ „ „ „	183
19.	<i>Neocercophana philippii</i> ♂, „ „ „ „	184
20.	<i>Microdulia mirabilis</i> ♀, genital sclerite	185





A. *Fregata minor ridgwayi*. (Female ad.)
Culpepper I., Galápagos Is.

B. *Fregata magnificens magnificens*. (Female ad.)
Jalisco, Mexico.



A

B

$\frac{1}{3}$ natural size.

Fregata magnificens magnificens. (Male ad.)

B. *Fregata minor ridgwayi.* (Male ad.)

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